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RESILIENCE PROFILE - TORIT

2019

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RESILIENCE PROFILE - TORIT

2019

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KEY RESULTS

DESCRIPTIVE ANALYSIS

- Torit's traditional leaders are predominantly elected. Focus groups expressed various critiques of leaders and politics.
- Over half of households in Torit are familiar with the humanitarian, development and service agencies in their region, far more than any other CPA. Torit's labor economy seems highly intertwined with existing agencies.
- Compared to other CPAs, domestic risks such as child abuse, domestic violence, alcohol abuse were very high. Qualitative data corroborates these risks and highlights the commonality of rape—and how underreported rape is due to fear.
- Focus groups in Torit were more outspoken and articulate than other CPAs about gender-based violence generally. This may be in part due to the strong presence of agencies focused on women's education, gender-based trainings and counseling for victims, but impacts linger: "Rape leaves women traumatized, lost, hopeless, unhappy, stressed and unready for the future."
- Forestry, water and fish are major natural resource conflict sources.
- Focus groups noted that aid work can exacerbate the sense of equity between tribes since, "NGOs are working on tribal and ethnic lines which is part of the government work." They noted that, "the government sends relief items to benefit all people, but due to tribalism, the distributors will only serve their people."
- Based on qualitative comments, residents in Torit may be more attuned to the politics of aid and resource access, including the influence of nepotism and inequity between tribes since "NGOs are working on tribal and ethnic lines which is part of the government work." They noted that, "the government sends relief items to benefit all people, but due to tribalism, the distributors will only serve their people."
- Qualitative data also suggests that women and students themselves (especially girls) pay schools fees, often from income earned by alcohol production.
- Qualitative data highlight concern for water quality, lack of chorine, hand-washing and sanitation health concerns. Numerous comments identified a shortage of latrines, full toilets (leading to open defecation), difficulties in constructing them.
- Torit rated the government more unfavorably than any other CPA. Torit demonstrates more knowledge about government and agency aid services, so it is also possible that Torit households hold higher expectations. They may also lack opportunities (or aspiration) to be more self-sufficient, and thus depend more on government and aid services for survival.
- Torit's food insecurity rate of 81% was among the most severe, primarily attributable to floods and droughts, though survey data may underrepresent the role of conflict in food shortages due to fear of cultivation.
- Bush-burning, charcoal-burning and over-grazing are rampant, threatening agricultural resilience by deteriorating soil structure, decreasing productivity and biodiversity, and exacerbating erosion and runoff pollutants. This may also require new skills in terms of soil management practices that preserve the "spongy" quality of soils by maintaining higher levels of organic matter and plant roots in the ground – thus enabling soils to better mitigate the effect of both floods and drought.
- Households in Torit prioritize a sorghum almost exclusively, causing alarm for food security, micronutrient deficiency and vulnerable ecosystems due to monocropping. Even within

households/gardens, Torit's crop diversity is very minimal—despite 80% of Torit's population participating in crop production.

- The labor market in Torit is severely undeveloped and limited. Outside of agriculture, the main livelihoods are extractive or potentially socially destructive, which is of grave concern in Torit due to the severe rates of alcohol abuse and increasing floods and droughts.
- Many in Torit face unemployment: "Unemployment is also a challenge as majority of the people are not working but rather begging and living under missionaries."
- Qualitative data corroborated the rampant unemployment, lack of entrepreneurial innovation and resulting sense of desperation. Women expressed more interest in creating businesses: "Women work in groups and encourage competition to increase earnings. Most men drink even the little amount of money they get."
- There may also be major differences in pay scales, in part due to the presence of agencies, with concerns for potential impacts on food security: "the rest of us can't afford to buy commodities like the organizations' workers,"
- There is risk of increasing influence of drugs and illicit activities: "Youth rent houses and live alone but you can't tell where they are working or how they are feeding themselves."
- Only 55% of surveyed households have regular access to a common open market, the lowest of any CPA.
- The average size of the households surveyed in Torit was 5.0 persons. In Torit 26% of mothers and nearly 30% of fathers live outside the household. Most households identify as Christian, predominantly Catholic. Ethnically, Torit is primarily Otuho, and nearly 20% "other."

- Over 70% of households indicated that traditional leaders play a more important role than political leaders and nearly 10% believed they have equal importance, but leadership is evolving: "*The youth of today have no respect compared to those in the past who considered traditional leaders like their gods.*"

- Comments exposed the tensions of aid investments and favoritism, as well as lack of coordination and consultation with communities and government.

- Torit has exceptionally high for domestic risks such as child abuse, domestic violence, alcohol abuse.

- Focus groups in Torit were more outspoken and articulate than other CPAs about gender-based violence generally—perhaps due to the strong presence of agencies, often focused on women's education, gender-based trainings and counseling for victims.

- Surveyed households cited revenge, tribal affiliation and livestock as the main contributors to conflict, followed by lack of rule of law and weak government, fishing, firearms availability, grazing, unemployment, water and weak conflict resolution. Recent changes in property rights and the development of industries has exacerbated these resource conflicts.

- Children are sometimes used as payment, similarly to livestock, and child abduction is concern.

- Generational and cultural tensions are intense, especially as youth seem drawn to the streets. Focus groups also emphasized the role that youth play in conflict resolution and peace-making.

- Torit may be more attuned to the politics of aid and resource access, including the influence of nepotism and inequity between tribes

- Compared to other 7 CPAs, Torit has moderate rates of literacy and household members that have been to school. This indicates poorer utilization of schools compared to the other CPAs given the proximity of most households to primary and secondary schools. Qualitative data reveals that this may be in part due to teacher absenteeism, lack of effective schools, and students leaving their studies to participate in "niggas," cultural barriers for girls, early marriage and pregnancy.

- Despite complaints of barriers for girls, some advocated strongly for girls' education and girls' self-empowerment

- Torit have experienced moderate-to-poor-quality health care services. NGOs play in providing health access, including for HIV and victims of domestic and gender violence, yet there is tremendous fear for women around issues of stigma and HIV.

- Focus groups encouraged collaboration with community groups and "*mojomijo*" youth groups help care for the sick, disabled, and community mental health through peace clubs, poetry, music and drama.

- Torit households depend on vendors (from a borehole) for water and travel less than 15 minutes to the available water source. Qualitative data highlight concern for water quality and sanitation health concerns, and limited toilets/

- Torit rates the government more unfavorably than any other CPA and demonstrates more thorough knowledge about government and agency aid services; thus, it is also possible that Torit households hold higher expectations of the government than other CPAs. Focus groups were critical of government's ability to listen to communities, nepotism, inequitable distribution of resources like minerals, and poor land management.

- Torit's food insecurity rate of 81% was among the most severe. Most households responded to food insecurity by purchasing food, or secondarily gathering wild food/fishing/hunting, relying on relatives, or NGOs. Survey data primarily attributed food shortages to climatic events: droughts and floods. Focus groups indicated that *"If it wasn't for the crises, people would be able to produce enough food."*

- Torit households may be more permanently turning to other food access sources besides food production. In certain areas cultivation may have ceased due to conflict.

- A delayed rainy season severely has severely delayed the planting season, which may require crops that produce quickly (e.g. within 90 days) as well as new skills in terms of soil management practices that preserve the "spongy" quality of soils, and attention to environmental destruction.

- Bush-burning, charcoal-burning and over-grazing are rampant; these human activities threaten agricultural resilience by deteriorating soil structure, decreasing agricultural productivity and biodiversity, and exacerbating erosion and runoff pollutants.

- Fires also threaten homes and crops, require people to construct fire lines. There is need to *prune, plant and preserve*, encourage applied agroforestry knowledge.

- Households in Torit prioritize a sorghum almost exclusively. Even within households/gardens, Torit's crop diversity is very minimal—drawing attention to the opportunities to improve nutrition outcomes, food security and biodiversity. Focus groups indicated that "*Farmers are being*

trained with knowledge on a variety of crops, rather than dwelling on sorghum." Diversification efforts may not always meet the intended purpose.

- The labor market in Torit is severely undeveloped and limited. Alcohol brewing dominates the market labor activities, as well as charcoal burning, firewood collection and petty trade.

- Many in Torit face unemployment: "*Unemployment is also a challenge as majority of the people are not working but rather begging and living under missionaries."* Torit may be particularly caught up in the tension between modern and traditional life: "*Our people want the modern easy life and they spend their whole day in town playing cards and in the evening they come home and demand food from their wives."* Qualitative data also articulated an increasing influence of drugs and illicit activities

- Only 55% of surveyed households have regular access to a common open market, the lowest of any CPA. Comments noted the volatile prices, inflation tied to the dollar and the need to reopen the roads. Focus group remarks also highlighted the role of trade, though opinions diverged.

- Torit was keenly aware of its dependency on aid: "*How long will the humanitarian organizations continue providing services such as ready food to the peoples? Rather they should come up with initiatives of training people on how to manage themselves…We don't want service providers to be brought from outside. Rather, we want agricultural institutions and universities to train our own people to deliver the services."*

RESILIENCE MEASUREMENT

- Variables reflecting access to vocational training and free health care play the most prominent roles in the Access to Basic Services pillar.
- The predicted numbers of sponge mattresses and beds make the largest contributions to the Assets pillar, followed by predicted numbers of stoves.
- The variables that contribute the most to the Adaptive Capacity pillar are those related to agricultural livelihood strategies: the number of crops planted and the number of agricultural livelihood activities.
- Knowledge of organizations doing humanitarian or development work in the community carried the most weight in the Social Safety Nets pillar, followed by access to remittances from outside South Sudan.
- As expected, the estimated resilience score has a positive effect on food security, as measured by the predicted numbers of household meals consumed by children and by the predicted Household Dietary Diversity Score (HDDS), with the largest impacts on the HDDS.
- Of the four pillars, only Access to Basic Services and Assets have significant effects on the resilience score.

- The effects of the pillars on resilience are not linear, suggesting the existence of threshold values that must be reached before increases in the pillar values begin to affect resilience positively (in the case of Access to Basic Services) or negatively (in the case of Assets).

- Despite the pillars' nonlinear relationships with resilience, elasticities suggest that increases in both the Access to Basic Services and Asset pillar scores will positively affect resilience for households with average scores.

- Female-headed households have worse outcomes than male-headed households for all of the food security indicators, especially for the numbers of meals consumed by adults and older children.
- Female-headed households also have lower resilience scores than male-headed households, while households with heads aged 36 and older have lower resilience than households with the youngest heads. Households in Ifwotu, Nyong and Torit payams have higher resilience than households in Bor.
- The average Access to Basic Services pillar value among sample households is over the threshold score beyond which increases in pillar values affect resilience. This suggests that efforts to increase access to services are contributing to increased household resilience and food security.
- However, it also suggests that there may be a large number of households with pillar scores moderately below the threshold. Efforts should focus on increasing these households' access to services.
- The average Asset pillar scores for sample households are far below those at which increases in the score may affect resilience negatively. It seems quite likely that efforts to increases asset levels in Torit would have a positive rather than a negative, effect on food security and resilience.

BACKGROUND AND INTRODUCTION

Following four decades of civil war, South Sudan's independence in July 2011 was met with international goodwill focused on putting the country on a development trajectory that finally brings about food security, health, education, and economic growth and development. However, a resumption of civil war in 2013 hindered the country's road to economic development. The protracted conflict has created a humanitarian crisis in the country that has left tens of thousands of people dead, displaced millions more, and worsened food insecurity in the country. Livelihoods have further been battered by the effects of climate change due to more frequent and prolonged droughts and floods as well as pest infestations. Food production has been destabilized by the war, droughts, and weak national institutions and policies, and as a result in early 2017, parts of South Sudan, particularly in the north, experienced a famine that affected about half of the population. More recently, the latest integrated food security phase classification shows that in January 2018, 48 percent of South Sudan's population (5.3 million people) was estimated to be facing crisis and emergency acute food insecurity.

The effects of a long-drawn-out conflict and climate change in the face of a weak national policy system and institutions have severely affected the food security, nutrition, and well-being of South Sudan's most vulnerable. Therefore, South Sudan requires a broad coalition of support to address not only the urgent humanitarian crisis but also to help restore production systems and help communities cope, recover, and build their resilience to shocks and crises. Restoring production systems and productivity is important because growth in the agricultural sector remains the most effective driver for poverty reduction and restoring livelihoods in many African countries.

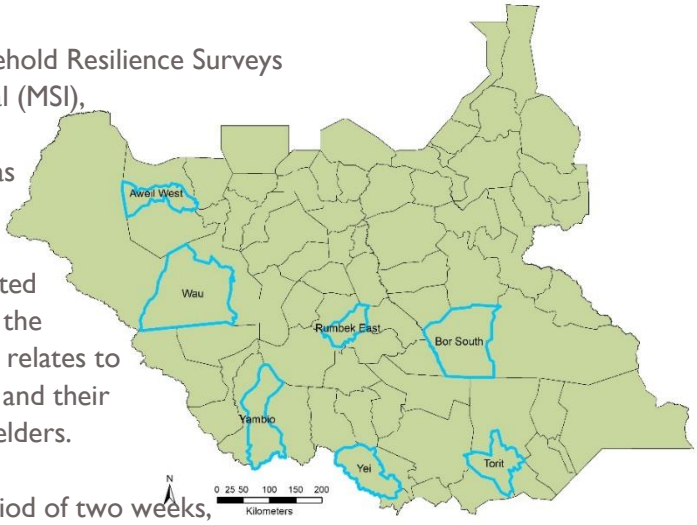
Given the multiple players involved and the weak national policy and institutional apparatus in the country, the United States Agency for International Development (USAID) in South Sudan has put together a *Partnership for Resilience and Recovery* (the Partnership, hereafter) in South Sudan that places community institutions at the center of efforts to build the resilience of livelihoods and production systems in the country. The proposed partnership is aimed at producing business models (interventions) for integrated humanitarian and development services through community-based delivery mechanisms that emphasize the productive sector as the foundation for resilience and recovery in five target regions: Torit, Wunlit Corridor, Wau, Aweil, and Yambio. The partnership provides a framework for the colocation of investments across all sectors; coordination of activities across partners; and collaboration among partners and stakeholders in defining and delivering interventions that achieve social cohesion, resilience, and recovery for long term development.

This report is an input into efforts to design interventions and investments in Yambio. It shares detailed findings from household data collection which shed light on living conditions, livelihood strategies, and household resilience in the region. The report has two major sections, which discuss findings from the descriptive analysis and from econometric analysis of resilience, respectively. Section one is divided into subsections on demographics; trust in people and institutions, including leadership, institutions and conflict; access to basic services, including education, health services, water, and other government services; and productive capacities, including food insecurity, agricultural productivity and market access. In section two, we implement the FAO's Resilience Index Measurement and Analysis-II (RIMA-II) methodology to explore the contribution of the factors discussed in section one to household resilience and food security. Section two discusses the calculation of the RIMA index and explores additional determinants of resilience. Both section one and section two end with a summary of key messages.

DESCRIPTIVE ANALYSIS

1.1. DEMOGRAPHICS

This analysis is based on the Community Household Resilience Surveys completed by Management System International (MSI), in 2018. Data was collected from the seven counties, known as Candidate Partnership Areas (CPAs) in South Sudan: Yambio, Awiel West, Torit, Wau, Bor South, Yei and Rumbek East. Consultations with various stakeholders facilitated the selection of these seven communities, with the objective of profiling community resilience as it relates to conflicts, livelihoods, poverty, shocks, markets, and their distinct impacts on men, women, children and elders.



Household surveys were conducted over a period of two weeks, including travel, training and fieldwork activities. Each enumerator surveyed roughly 60 households. Enumeration Areas were selected by probability proportion according to household size. The sampling frame was based on the 2008 Population and Housing Census conducted in South Sudan, with some updated information (Lubaale, 2018). Though sample sizes (*n*) differ for individual questions, the number of households surveyed is enough to validate the survey results as acceptable basis to guide policy design and implementation (Table 1.1). We also use qualitative MSI data gathered from focus groups discussions with farmer groups, adult females, adult males, male youth, female youth, schoolteachers, female farmers, male farmers, community-based organizations (CBOs), government peace committees, faith-based organizations (FBOs), and key informant interviews with local leaders, chiefs, executive directors, teachers and peace committees. All qualitative data in quotes comes from MSI focus groups and interviews.

The average size of the households surveyed in Torit was 5.0 persons. Our results suggest that households in all CPAs face displacement and migration of family members. The absence of parent(s) in the household can hinder resilience by increasing the dependency burden on other adult caregivers or teenage children; research indicates that lower dependency ratios facilitate higher the adaptive capacity (Vincent, 2007). The MSI survey indicates that in Torit 26% of mothers and nearly 30% of fathers live outside the household. A small percentage of families reported a deceased parent(s) or that they do not know whether the parent living outside the household is alive or deceased (Figure 1.3).

Most households identify as Christian, predominantly Catholic, with a small percentage of Pentecostal, Anglican and Adventist. Less than 1% are Islamic (Figure 1.2). As shown in Figure 1.1, Torit is primarily Otuho, and nearly 20% "other." Ethnic tension and especially tribalism were frequently mentioned in qualitative focus groups and interviews.

Population distribution in Tori suggests that female predominate across all age groups except elderly (Figure 1.4). Focus groups complained of children and youth being used as payment in exchange for goods or services, as well as the kidnapping of children. It is possible that boys are primarily targeted. Boys and men may also more commonly migrate or become involved in "bush" or "nigga" groups or conflict or have been killed in conflict (Torit has the smallest household size average of any of the CPAs) – all potentially contributing to the loss of the young male population.

Figure 1.1

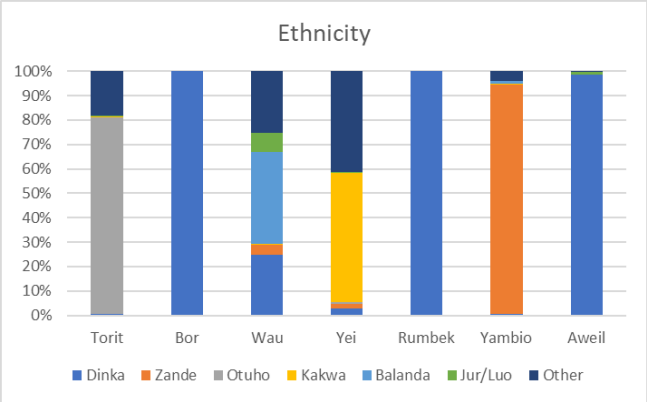


Figure 1.2

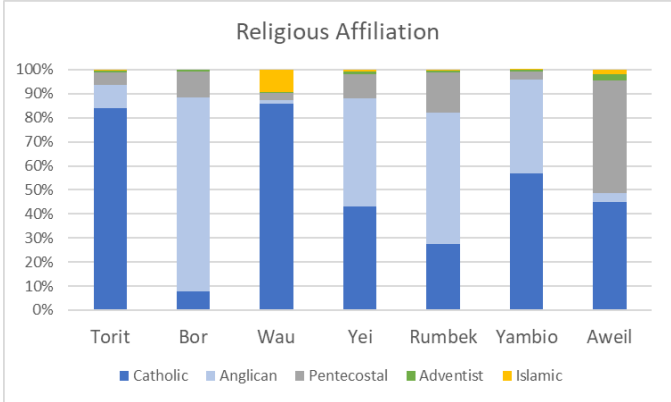


Figure 1.3

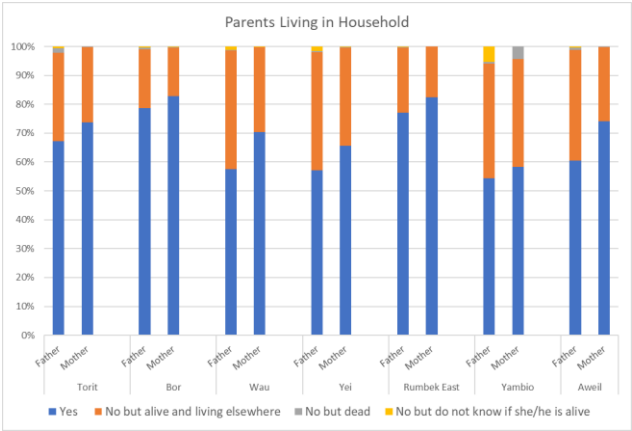
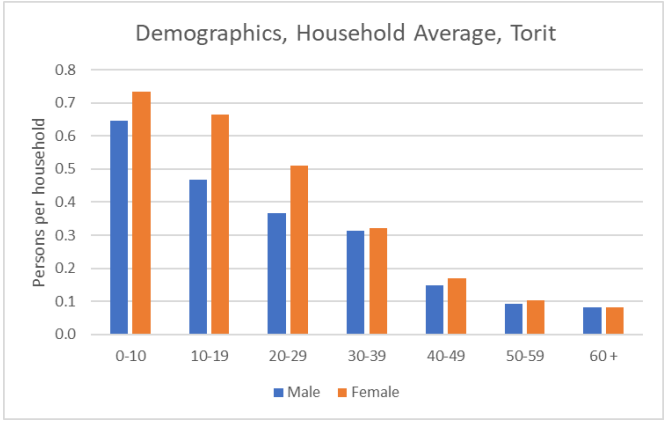


Figure 1.4



1.2. TRUST IN PEOPLE AND INSTITUTIONS

LEADERSHIP AND INSTITUTIONS

Survey results suggest that chiefs and local government predominant affect local households. (Figure 1.7). Over 70% of households indicated that traditional leaders play a more important role than political leaders and nearly 10% believed they have equal importance (Figure 1.5). Torit's traditional leaders are predominantly elected (Figures 1.6), more than in any other CPA. Across the seven CPAs traditional leaders seem to carry more importance in the counties that predominantly elect them (Figures 1.5 and 1.6). Qualitative data displayed an impressive amount of political commentary, discussion and critique of leadership of all types; this may be partly due to elections of traditional leadership, which cultivates more widespread opinionating about leadership, more closely knits them to the political infrastructure, and imbeds a different level of accountability into traditional and other leadership roles. For example, "*If a youth leader is not satisfactory, then he/she can be replaced at that particular time. This is an elected type of leader.*" Interviews and focus groups also suggested that "Traditional leaders have a role, but not as much as in the past." This may relate to elections, the dominance of youth in the population and their changing relationship to leadership: "*The youth of today have no respect compared to those in the past who considered traditional leaders like their gods.*"

Figure 1.5

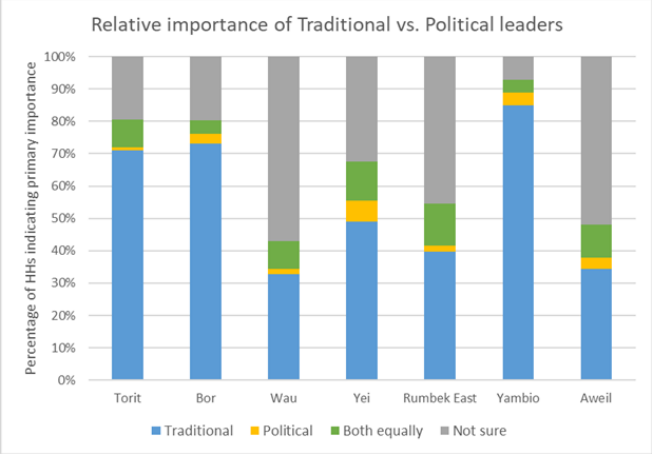
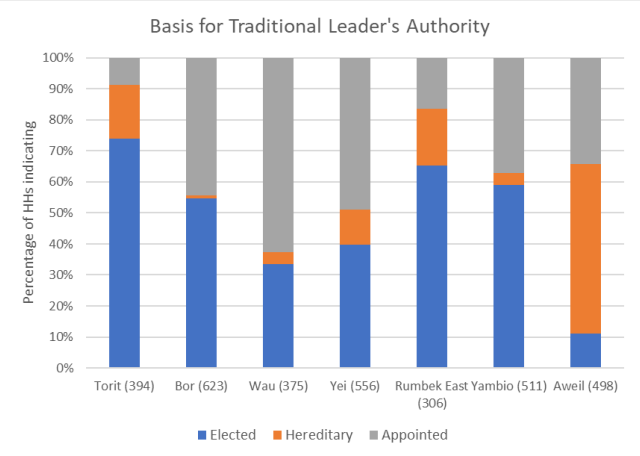


Figure 1.6



Over half of households in Torit are familiar with the humanitarian, development and service agencies in their region, far more than any other CPA (which ranged 13-26%). According to surveys, among households familiar with agencies, *Médecins Sans Frontières (MSF)* and *CARE International* were most familiar, followed by *UNICEF, FAO* and *Red Cross;* Figure 1.9 indicates the agencies familiar to households that know of at least one agency. The strong familiarity with agencies in Torit is curiously paired with less favorable views on agencies, according to qualitative data. Whereas most CPAs positively reviewed agencies, Torit's viewpoints were mixed.

The influence of humanitarian money was clear from focus groups and interviews. Far more than other CPAs, Torit seems to have even adopted development/aid lingo. "*Nothing will hinder national and international groups from forming partnerships to enhance resilience.* The view of agencies was generally more positive than government: "*Government has not provided any assistance to the community rather it is the*

humanitarian agencies that provide help." Yet comments exposed the tensions of aid investments and favoritism: "*Due to political influence, many organizations are concentrated in one area for example, Ikotos while other areas are suffering.* And: "*For example, food items distributed by WFP are diverted to other personal business and thus don't reach the local people.*"

Figure 1.7

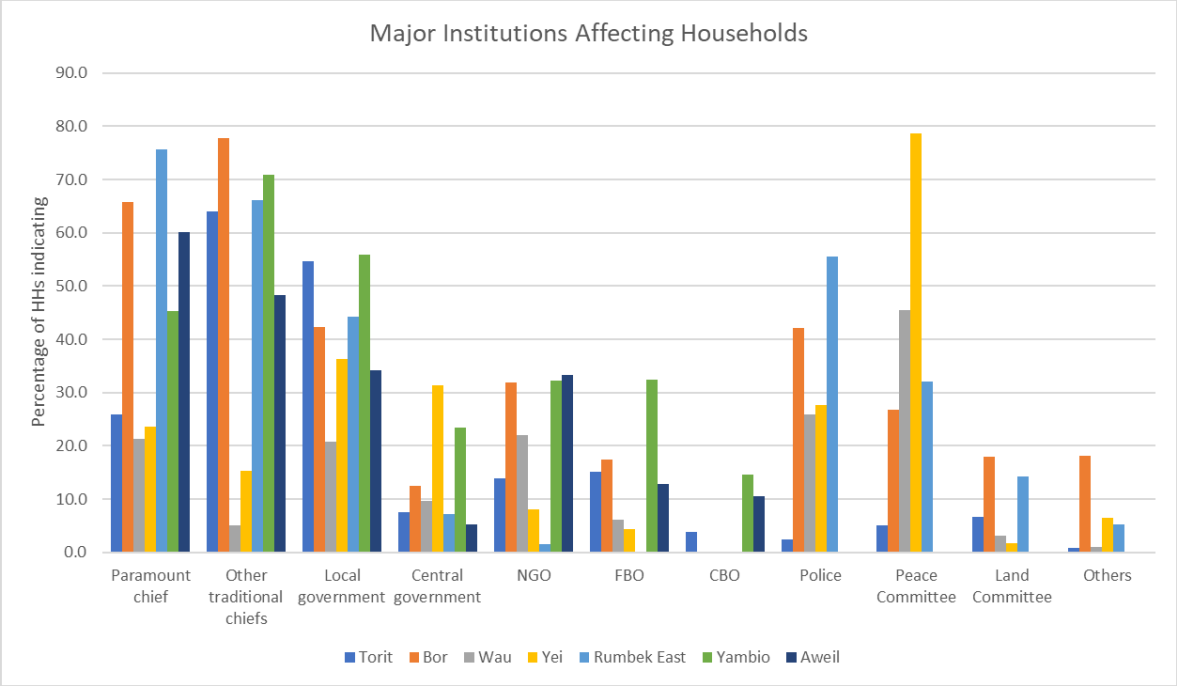
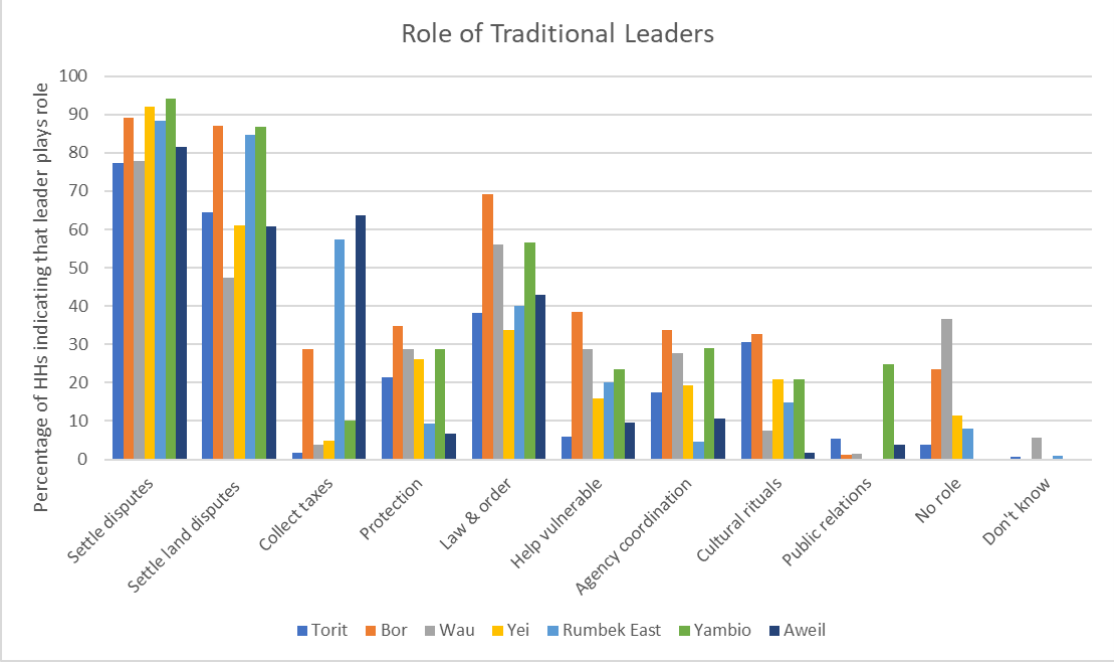


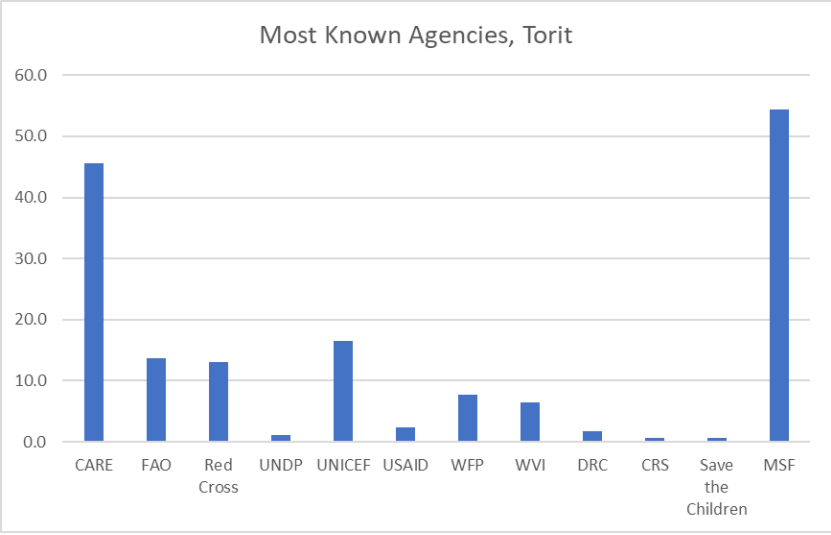
Figure 1.8



There appear to be "haves and have-nots" due to awareness or connections to aid: "*If you don't know anyone responsible for distribution of items, then you will not get the information and you will only find people going for rations.*" The "registration" required to receive some aid also ignores parts of the local population: "*Ever since I came to Torit in 2012, I have never been registered in my home and have never received anything. I survive by the work of my hands.*" Humanitarian aid seems to be viewed like any big industry and overshadows the contributions of more small scale or traditional local efforts: "*All the trade unions, FBOs are lobbing funds from the same humanitarian agencies which provide the help while the Mojomojo* [traditional youth peace and action groups] *can only afford to gather wild fruits.*" Focus groups and interviews expressed bias for certain agencies: "*There exists a good relationship between the civil society and the government, but the donors do not listen to the civil society…The international NGOs don't trust the local NGOs to use the money correctly.*" Improving resilience and peace in Torit may require building more trusting relationships and communication across different types of agencies. International agencies and donors should also be sensitive to how the expectations of "flashy" aid may discourage or even undermine local grassroots efforts: "*As a civil society, we are trying to help with our local resources although we don't have the big funding and cars people are accustomed to.*"

Finally, Torit residents critiqued the lack of coordination and consultation by agencies. "*Another barrier is the lack of consultation while preparing projects. One cannot implement a project without consultation; thus, plans should be given to community government so as to own them.*" It was not clear whether Torit residents believed that agencies are well-tuned in to the needs of the community: "*People turn to informal groups because they are knowledgeable about the community.*" Some believe agencies over overstepped their role: "*The NGOs should also stop doing the work that's for the government… The NGOs are working on tribal and ethnic lines which is part of the government work.*" According to some community views, the multiplicities of agencies do not coordinate and communicate well: "*There needs to be a forum for dialogue with international agencies to avoid duplication of services in the community…There are many CBOs here, over 50 are registered in the counties…There is need for proper coordination between the international organizations, local NGOs, CBOs and the government.*"

Figure 1.9



CONFLICT AND RESOLUTION

Figure 1.10 indicates the pervasive social risks and threats of violence in Torit and other CPAs, both domestically and outside the home. Compared to other CPAs, the prevalence of households affected by social risks is relatively moderate outside the home, but exceptionally high for domestic risks such as child abuse, domestic violence, alcohol abuse. Qualitative data corroborates these risks, but also highlight the commonality of rape—and how underreported rape is due to fear.

Figure 1.10. Predominant Social Risks, by Country and Risk Type

Outside the home, households reported cattle raiding, burglaries/robberies and gang activity as the most common risks. Within households, the strongly associated risks of alcohol abuse, domestic violence, child abuse and teen pregnancy are common, with particularly deleterious effects on women and children. More than 30% of households indicated rape was a prevalent social risk and focus groups of women exposed serious and rampant concern for rape: "*Many women have been raped, but cases have not been reported, because they either talk about it privately or don't speak out about it at all.*" There was concern for how rape has further spread HIV/Aids, its lasting impacts of trauma—including suicide: "*Sometimes husbands blame the women for being raped and send them out of their homes and these women sometimes end up committing suicide.*" Rape, indirectly, targets both women and men: "*We have high rape cases and some women and girls are purposefully raped to provoke their male relatives.*"

Figure 1.11

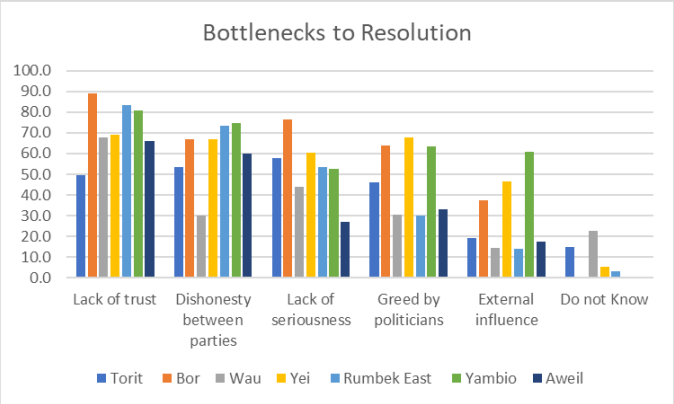
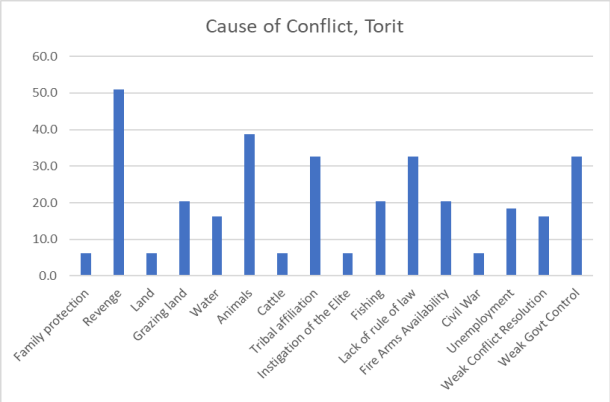


Figure 1.12



Focus groups in Torit were more outspoken and articulate than other CPAs about gender-based violence generally—perhaps due to the strong presence of agencies, often focused on women's education, gender-based trainings and counseling for victims: "*There are some people in Torit town who have taken the issue of gender violence seriously and they try to get information of what happened and even try to help the victims.*" Focus groups highlighted gender abused in their community: *You find that according to tradition some women can be forcefully inherited like property and this brings problems…. some of our mothers are making forced marriage to their girls, so that they can get money to eat at home.* Culture and resource-desperation drive the decisions of young women and families; both may lead to early pregnancy: *A girl is taking a husband because of conditions. She will search for husband to take care of her and in the end, she will not find good husband, but will start producing tomorrow and next tomorrow and he will leave her.*"

Surveyed households cited revenge, tribal affiliation and livestock as the main contributors to conflict, followed by lack of rule of law and weak government, fishing, firearms availability, grazing, unemployment, water and weak conflict resolution (Figure 1.12). They specifically identified forestry, water and fish as major natural resource conflict sources, as well as oil and gum arabica to a lesser degree (Figure 1.13). Qualitative data also highlighted the tense community conflicts over limited natural resources and livelihood options: "*Conflicts arise due to grazing areas, the water points, fishing grounds and also land and border issues between communities.*" Recent changes in property rights and the development of industries has exacerbated these resource conflicts: "*Now that fish has become a business, they claim that the resources belong to and are for the benefit of the people of that community and no longer for everybody.*" Outside interest in resources, including gold and petroleum, has also stoked the conflict: "*Previously, people didn't know the value of land or the use of resources, but after independence and signing of the CPA, they came to know the value of land. This started problems within the communities.*"

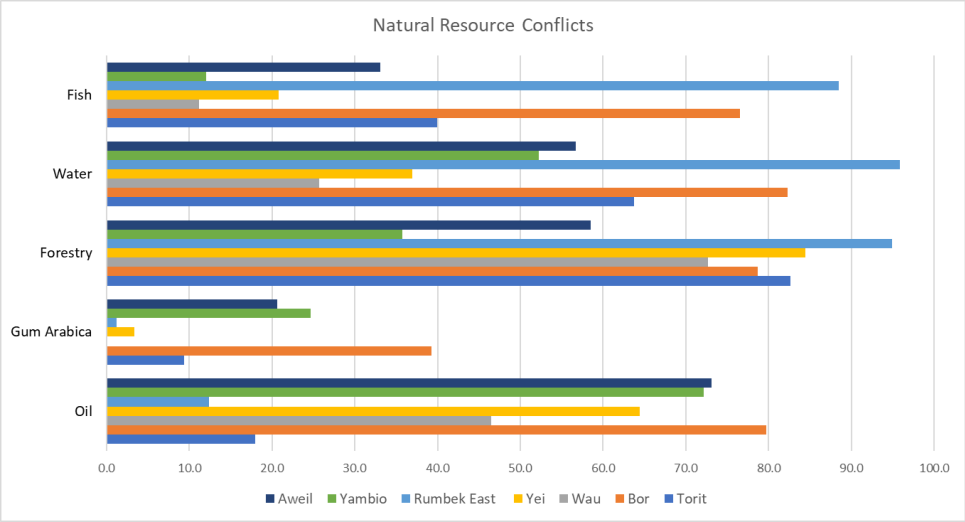
Focus groups also echoed concerns of tribally-stoked conflict: *"This tribalism conflict spreads down to people in villages who don't even know about the divisions."* As in many regions, livestock are at the center of conflicts: "*They can steal a cow and sell it later; they can even kill it and sell the meat.*" Retribution for lost or stolen animals sometimes recruits the entire community: *Community drums call everyone to the field; if you beat the [drum] for enemy, then people will fill the field…ready with guns and spears; then will listen to the story and then work until they return the cows.*" There is both financial, food security and cultural element to livestock due to its role in payment and marriage. *"For example, when it comes to marriage, bride price in the areas from Torit to Guru is set at 13 cows and 120 goats, regardless of where you are from."*

Grievously, children are also used as payment, similarly to livestock. "*There is a new assumption that people are abducting children to exchange them for cattle, which in turn they can sell to earn money…In order to stop a child from being used as compensation, two people who were wronged can solve their problems with cows."* While a source of wealth generation, livestock prove contentious across South Sudan since they are a source of conflict, often destructive to natural resources and soil health, and socially volatile.

"The issue of child abduction is a national concern." Even schools must contend with this risk: "*We teachers refused the child to be used as compensation and stated that the child must study."* Abduction leaves children and families traumatized: "*There are a lot of mothers affected by child abduction, leaving them hurting and psychologically tortured. They can't work and are just inviting death."*

Torit contends with many contributors to conflict—from domestic violence, poor or corrupt leadership, access to weapons and alcohol, cultural/generational divides, and lack of natural resources. Some comments blamed government for worsening conflict by equitable distribution of services, nepotism and inept land management. Some critiques were more targeted at military: *"Most of the crimes are committed by people in uniform,"* though *"presence of guns among civilians*" was also a complaint. General "*lack of relationships between neighbors"* was blamed for lack of solidarity, trust and lack of ability to resolve conflict. It seems inevitable that "*youth who are drinking alcohol end up fighting each other"* given the enormous industry of alcohol production and the surrounding culture of alcohol abuse. Generational and cultural tensions are intense in Torit, and far more than other CPAs, youth seem drawn to the streets: "*Disagreements between parents and their children who would rather stay on the streets than go to school."* Finally, food insecurity worsens conflict: *"hunger and poverty are agents of conflict because individuals go out to steal which leads to killings."*

Figure 1.13



Most surveyed households believe dialogue and traditional leadership remain the primary methods to resolve disputes. Households identified dishonesty, lack of trust and seriousness, and greed as the primary bottlenecks to conflict resolution, as well as external influence (Figure 1.11). The role of political greed and external influence may relate to natural resource conflicts (Figure 1.13). Qualitative data primarily

referenced more grassroots peace efforts, especially among the youth, but also acknowledge the role of traditional leaders and "courts" where offences are heard by both parties and considered. "*Issues are brought to the courts which are like the parliament where people sit and discuss certain issues and determine who is right and who is wrong."* There is overlap between traditional leaders and legal institutions "*the traditional spiritual leaders have a role in the community because they are not new in these villages/community and are well established with their own programs and organizations with different units such as the Mojomiji,"* and agencies may need to tread carefully in this space, considering carefully the role and clout of traditional institutions: "*Don't undermine systems in place: If there are issues of peace, you will have people meeting as a group with the chief and making the decisions and governing themselves."*

The role of agencies was most positive regarding their influence on gender relations and nurturing peace within households: "*We are thanking the NGOs very much, because they gave us ideas of how to live as family, with husband, with children and with neighbor."* Focus groups gave tremendous weight to the value of gender-based violence training: *"when it was distributed to people, people started agreeing with each other…No husband believed in his wife and wife believed in her husband until the gender-based violence training was done and people became equals."* Trainings has reached leaders: "*Traditional leaders have been given training concerning gender-based violence and also rule of law that has also changed them."* And the spillover of trainings has impacted community-organizing: "*A lot of women are coming together and fighting for gender equality."* Many women's groups also have a business/ entrepreneurial component. Women face pushback, even when some of the formal structures have changed: "*Some men will appoint a woman that is not meant to speak up and will only use her to cook or fetch water. Both men and women speak at the workshops and not like before when the men would talk for us. In the towns, there is a lot of talk on gender issues, but the men haven't changed much."* Nonetheless, the gender and domestic impact may be invaluable.

Focus groups repeated emphasized the role that youth play in conflict resolution and peace-making. "*The "mojomijo" is what we call our youth. They have a great role to bring peace…. It is faster to mobilize the youth and get them to pay attention and face the situation."* Comments noted the role youth play in returning stolen cattle, helping the sick and seeking food. They also praised the importance of arts and peace clubs among the youth: *"Peace clubs advocate for peace through gardens, dramas, poems and also debates…. Youth used to act dramas and make performances for the community, which also educates the community."* They also noted the need for further investment and training: *The youth leaders need to be trained so that they will have knowledge in handling cases in the community….Availing money to create programs that unite the youth….This can be enhanced by giving them offices, where they can meet frequently… Peace clubs should continue advocating for peace, even outside the of schools."*

Peace actions by agencies was generally lauded. "*The Action Group meetings help with early communications and stopping conflicts before they start."* Though generational, cultural and economic pressures continue to be a challenge to peace actions (*The busy schedule of women who are making local alcohol and youth, who are playing football, makes it difficult at times to hold meetings"),* efforts to "*get together and promote unity amongst themselves"* should not be underrated.

Figure 1.14

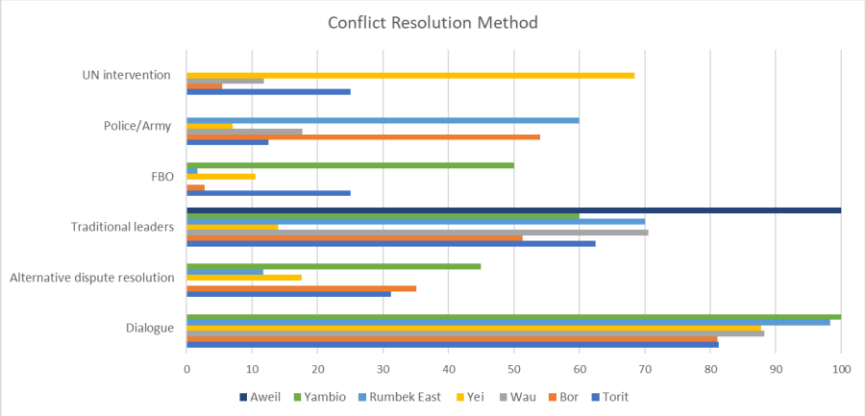
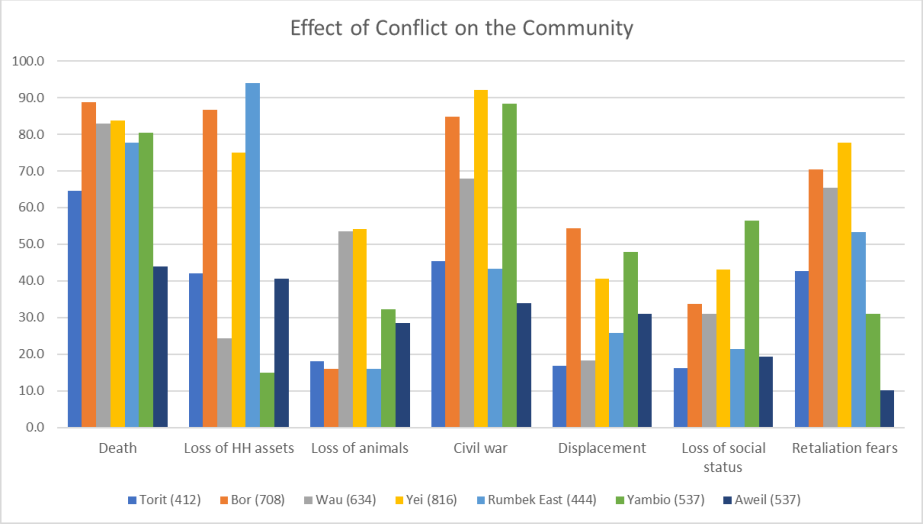
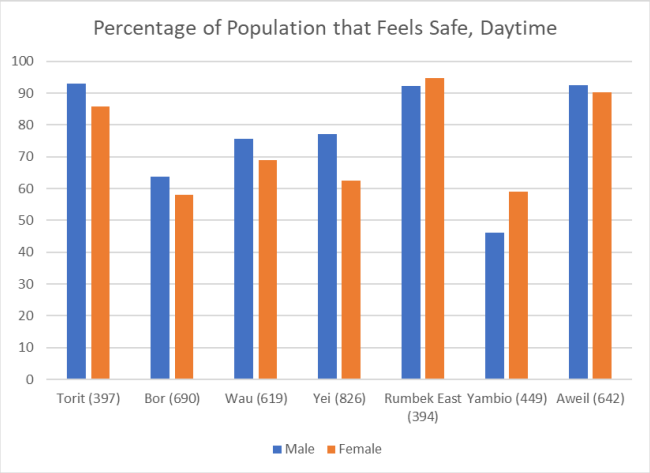


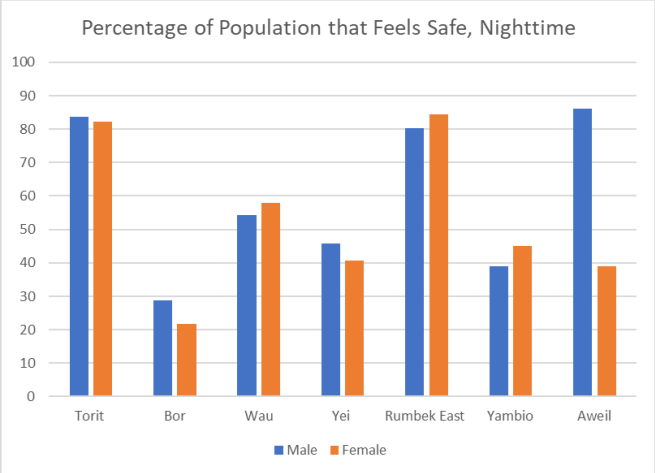
Figure 1.15



Most of households identified death, civil war and retaliation fears as the primary effects in their community (Figure 1.15). Over 90% of men and 80% women feel safe during the day in their communities, and somewhat fewer feel safe at nighttime (Figure 1.16). Qualitative data also echoed the felt sense of fear, and the full range of trauma's grip on communities and its intrinsic debilitation: "*There are a lot of mothers affected by child abduction leaving them hurting and psychologically tortured. They can't work and are just inviting death.*" They spoke extensively about its impact on women in particular, though men may not have felt the same liberty to express their fear. *"Rape leaves women even more traumatized, lost, hopeless, unhappy, stressed and unready for the future."* Though the psychological trauma and mental health disorders that stem from conflict, violence and social risks are difficult to quantify, they will play a major role in household and community resilience (Michalopoulos et al., 2015).

Figure 1.16





1.3 ACCESS TO BASIC SERVICES

Qualitative data from interviews and focus groups demonstrated a clear sense of the basic service offerings and shortcomings in the region, revealing more frequent contact and variety of services—or knowledge of possible services. Based on qualitative comments, residents in Torit may be more attuned to the politics of aid and resource access, including the influence of nepotism and inequity between tribes since *"NGOs are working on tribal and ethnic lines which is part of the government work."* They noted that tribalism has "*prevented services from reaching those in need…the government sends relief items to benefit all people, but due to tribalism, the distributors will only serve their people."* Lacking connections or official registration can be a barrier to services: "*If you don't know anyone responsible for distribution of items, then you will not get the information and you will only find people going for rations…. Ever since I came to Torit in 2012, I have never been registered in my home and have never received anything. I survive by the work of my hands."*

EDUCATION

Compared to other 7 CPAs, Torit has moderate rates of literacy and household members that have been to school. This indicates poorer utilization of schools compared to the other CPAs given the proximity of most households to primary and secondary schools [typically higher literacy and education rates (Figures 1.18 and 1.19) are associated with communities where a larger percentage of households live less than 5 km from a primary school (Figure 1.20) and secondary schools are prevalent (Figure 1.21)]. Qualitative data reveals that this may be in part due to teacher absenteeism, lack of effective schools, and students leaving their studies to participate in "niggas" or other informal adolescent activities. Torit appears to have more ubiquitous access to primary schools, but far less secondary school access. Like other CPAs, the difference between male and female literacy and education rates is severe. Communities often identified cultural barriers, not school distance, as the predominant reason not to attend school (Figure 1.22); qualitative responses (below) reveal more nuanced perspectives on the barriers to school attendance, particularly for girls. In Torit most schools are government-funded, with a tiny percentage of FBO or privately-owned schools (Figures 1.23 and 1.24). Though government-run schools predominate in Torit, agencies still influence: "*NGOs like the UK Impact have had a great impact on the teachers by encouraging them to teach."* Conflict has serious implications on education. Qualitative data highlight complaints of how the conflict has closed schools, raised costs and robbed remote communities of quality teachers, and parents of incomes to pay school fees. Children who have lost one or both parents in conflict often can no longer afford school fees.

Figure 1.18

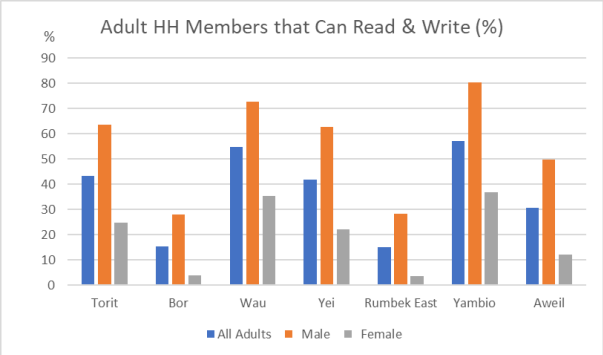


Figure 1.19

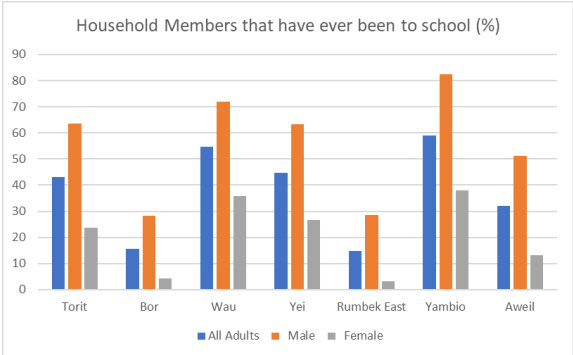


Figure 1.20

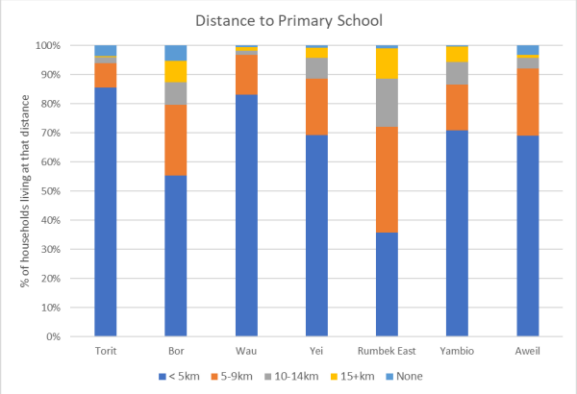


Figure 1.21

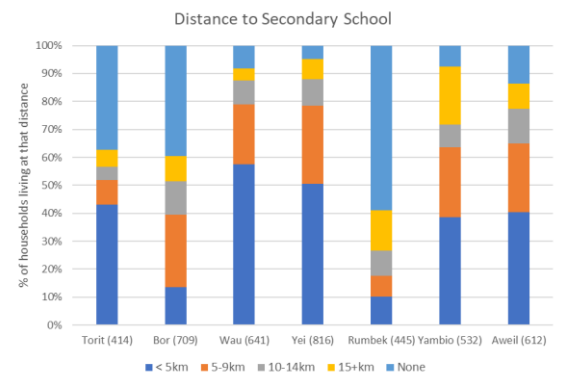


Figure 1.22

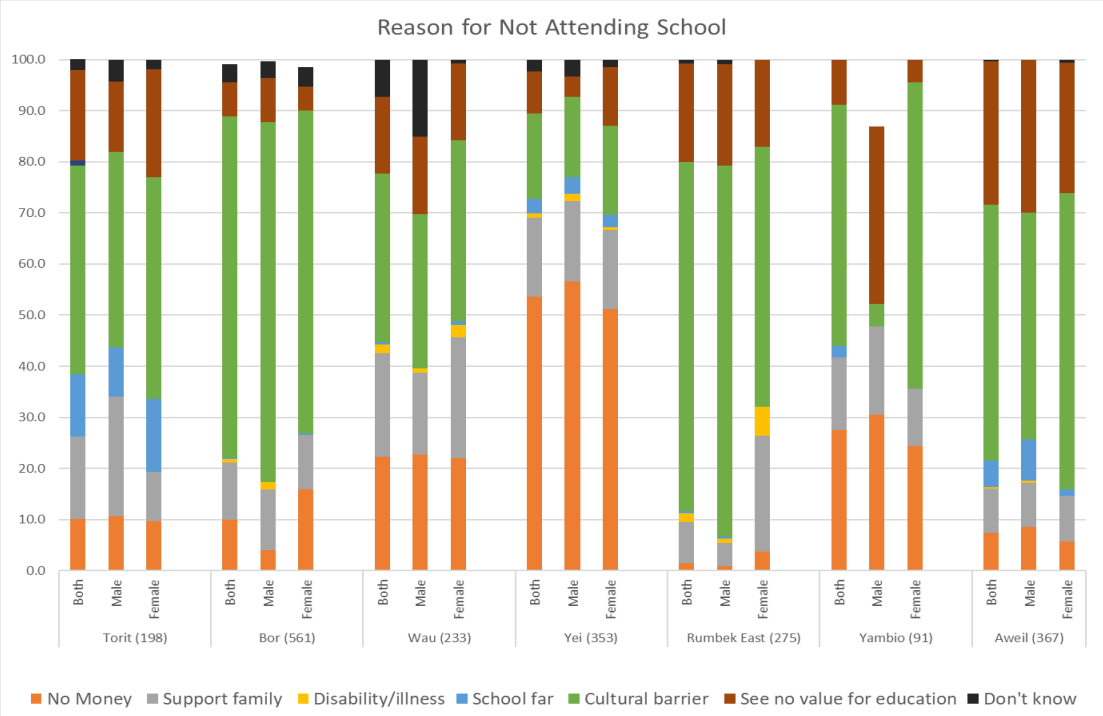


Figure 1.23

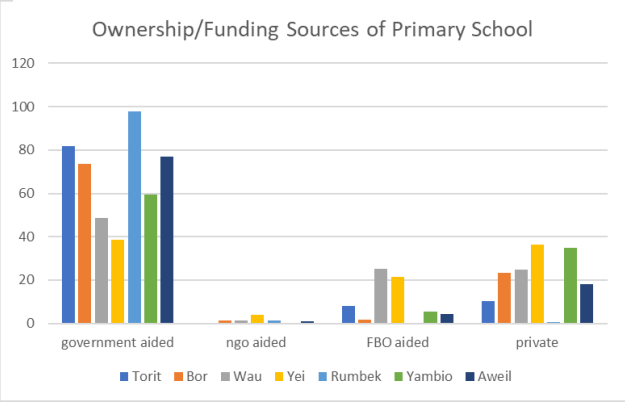
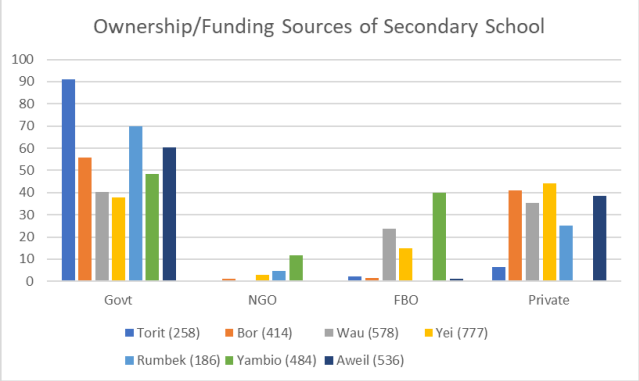


Figure 1.24



In addition to the barriers of cost, significant amounts of qualitative data from reflected the tense relationship around cultural forces that pull students away from school or prevent them from attending, such cultural barriers for girls, early marriage and pregnancy, drug activity, discos and "nigga" activity. Some communities actively advocate against early marriage as an education strategy: "*The community has advocated for an end to early marriages and empowered both girls and boys to stay in school.*" Judging by qualitative data, youth in Torit face more pressures of distractions than other CPAs: *The night clubs are spoiling our children who spend the whole night partying and can't attend school in the morning… If you join Niggas, especially girls, then they will leave school and put niggas more important than school on their lives…There are also high cases of drug abuse among the youth like the taking of opium…. The negative things they are doing is that they are going to DJ (Disco place) to drink alcohol.*" There may be fewer positive recreational activities available to youth in some regions, contributing to some of the social turmoil: "*There are no recreational centers for the youth and all the places that the youth had have been taken away leaving them feeling dependent and without a voice or capacity to solve problems.*"

Focus groups advocated that *"Youth associations should be formed to promote sport activities like football to keep them busy and away from activities such as drug abuse."* They also praised alternative education options: "*The government has opened up vocational schools with evening lessons to encourage [students] to stay in school,*" and advocated to expand *"creating programs that allow the young people to study in the evening and enable them do other things in the morning hours."* Others have simply advocated for "*separate boarding schools for boys and girls which limits the effects of adolescence.*"

Despite complaints of barriers for girls, some advocated strongly for girls' education and girls' self-empowerment: "*Ladies should be sent to school. If your parents are poor, we ladies, have a lot of things that we do with our own hands, which can help us to push on with our education.*" Qualitative data also suggests that women and students themselves (especially girls) pay schools fees, often from income earned by alcohol production. Others recognized of the benefits of not treating girls as property but investing in their long-term contributions: "*My advice to parents is that ladies should not be put as a source of wealth at home, because educated ladies will bring more money than the wife without education.*" Agencies and government could assist girls' attendance by compensating for the "*inability of the parents to provide sanitary products for the girls. Some schools and NGOs offer support to enable them to continue with school.*"

Finally, focus groups addressed gaps in curriculum and services "*most of the science from Uganda left during the 2013 war. We have two mathematics teachers. We have no teachers for physics, biology, and chemistry. We need help if the secondary school is to continue."* Torit also lack resources for children who are differently abled: *We don't have schools for the deaf and blind yet,"* and children in camps, "*Those who run to camps might have no access to schools and even when they do, they might not understand the language used by the teachers."* Language generally can be a challenge, as the utility of Arabic (the "market" language) and English (the "agency" language) evolve locally: "*Using one language makes learning faster and easier. Arabic can be taught as a subject to ease communication for example in market places…English should be the only language used while teaching. This also favors the children who pursue further studies abroad."* Others believe "*parents should allow their children to choose the language they prefer."*

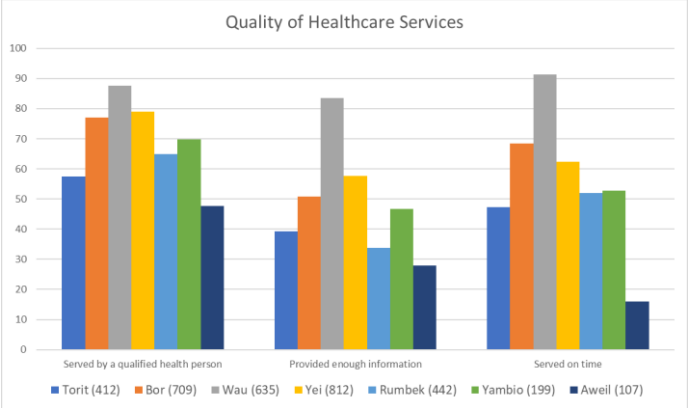
HEALTH

Relative to other CPAs, households in Torit have experienced moderate-to-poor-quality health care services. Forty to sixty percent of households are served by a qualified healthcare professional, received enough information during health visits, and are served on time (Figure 1.25).

Qualitative data demonstrated the strong role that NGOs play in providing health access, including for HIV and victims of domestic and gender violence: "*There are women centers having three women supported by health link to provide counselling to the survivors of rape, GBV and physical assault."* Nonetheless, there is tremendous fear for women around issues of stigma and HIV: "*Women fear to go to hospitals because of the harsh behavior of nurses towards them and also they are afraid of being asked to bring their husbands along and yet the husbands don't want to be screened for HIV…women who accept treatment are accused of infecting their husbands and are beaten at home."* Stigma extends beyond the clinic, with potentially devastating social isolation: "*There is a lot of backbiting, discrimination and stigma among the people. Only those who are aware of HIV victimization are the ones who don't stigmatize infected people."*

Some health efforts are entirely community driven, in part because "*health facilities have become inaccessible because of insecurity."* Focus groups encouraged collaboration with community groups: "*The international NGOs should use other lower levels such as the CBOs to deliver the services such as, distributing drugs to health centers,"* and oversight with community participation: "*There should be a committee from the public to run health centres and decide how the services should be provided."* This emphasis may partly stem from suspicion about financial interest at hospitals: "*The trained personnel in the hospitals will refer you to their private clinics so as to earn some money."* Focus groups noted that community and "*mojomijo*" youth groups help care for the sick and disabled—though these efforts also have been compromised: "*Our work in this place is helping the blind people, but from all this work our energy has been cut in half; we are not checking on them often."* Qualitative data spoke as urgently about mental health and "*mental disability because of the conflict"* as well as physical health. Many mental health services come through agencies and community groups such as the *mojomijo.* While not technically health services, it's clear that peace clubs, poetry, music and drama play a healing role in Torit. The mental and social health role of the arts should not be underestimated.

Figure 1.25



WATER

Multiple water sources may be available in each community, and while more Torit households depend on vendors (from a borehole), the primary sources vary widely (Figure 1.26). Most households travel less than 15 minutes to the available water source (Figure 1.27), the focus groups said there is *"need to establish water points in all areas to supply clean water."*

Qualitative data highlight concern for water quality and sanitation health concerns, and limited toilets. "*There was only one septic tank car in the whole of this town. Now, people's toilets are full but there is no way to remove the waste."* Many focus groups were remarkably familiar with the terminology of "WASH" (Water, Sanitation and Hygiene), and the local health risks due to poor services and lack of hand-washing (after using the latrine). Numerous comments identified a shortage of latrines, full toilets (leading to open defecation), difficulties in constructing them due to soil quality, laziness or cultural barriers: *"due to cultural norms, some people can't make use of the tools given to them to dig latrines,"* and *"most of the toilets people have are full and people don't use pit latrines because it's against cultural beliefs."* They identified a need for boreholes or borehole repair, and insufficient distribution of chlorine tablets in some areas.

Figure 1.26

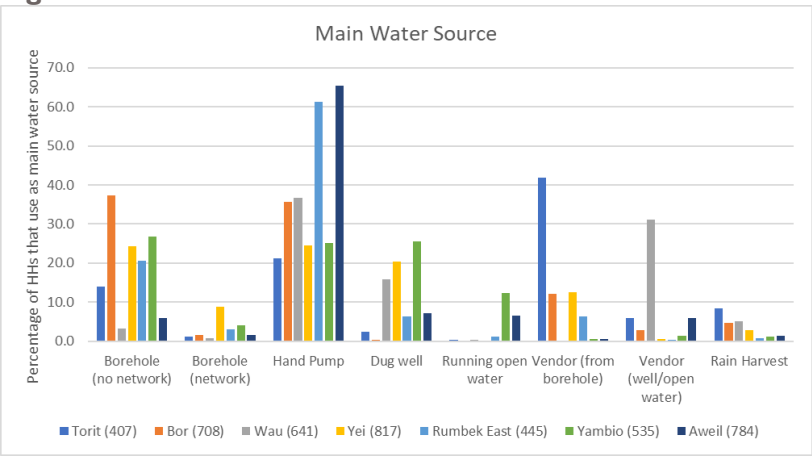
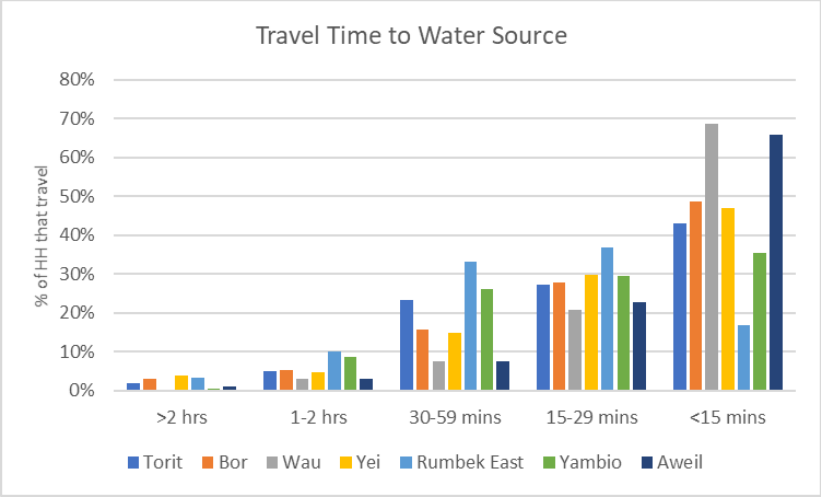
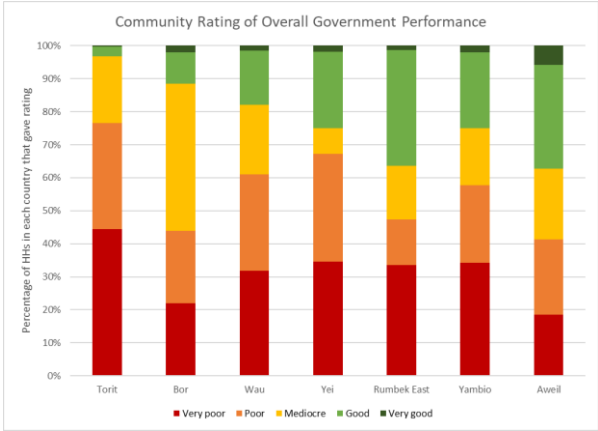


Figure 1.27



QUALITY OF GOVERNMENT SERVICES

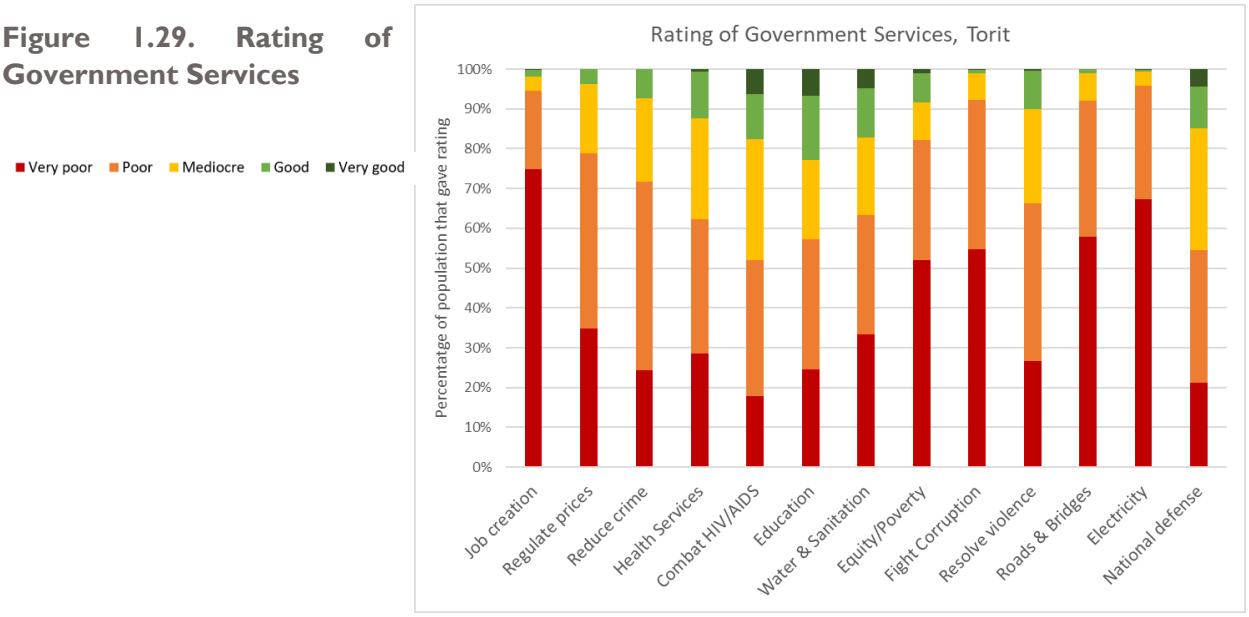
Figure 1.28



The seven CPAs generally have a poor view of government services and Torit is no exception, rating the government more unfavorably than any other CPA (Figure 1.28). Based on qualitative data and survey data about familiarity with agencies, Torit demonstrates more thorough knowledge about government and agency aid services, so it is also possible that Torit households hold higher expectations of the government than other CPAs. They may also lack opportunities (or aspiration) to be more self-sufficient, compared to other CPAs, and thus depend more on government and aid services for survival. Torit's population complained most about poor job creation, lack of electricity, poor transportation infrastructure, corruption and poverty/lack of equity (Figure 1.29).

Most qualitative data exposed a contentious view of government and its services. They were critical of government's ability to listen to communities: "*The government needs to first consult with the particular community before making arrangements of relocating it rather than bringing armed men to disorganize the community…The government is not complying with people's recommendation and there is conflict of interest.*" Comments criticized nepotism and inequitable distribution of resources like minerals, "*There is a need for proper policy on distribution of minerals so that everyone benefits.*") and poor land management: *"Owning land by government has issues. For example, there were issues with people who were given land titles by government but when in reality the real plots don't exist….The community in Torit has refused the issue of allotment of plots and demarcation of land….Its not clear as to who owns the land, the community or government…Land issues have resulted into conflicts because there is no dialogue between government and the community."* Key informant interviews with traders and businessmen exposed a more positive view of the government—particularly if local roads had recently been opened, or trading regulations had been relaxed. As a result, they were more willing to support the government: *"The conflict is now fading after the signing of the peace agreement. We* [now] *don't hesitate to pay taxes."*

Figure 1.29. Rating of Government Services



1.4. PRODUCTIVE CAPACITIES

FOOD INSECURITY AND AGRICULTURAL PRODUCTION

Most households in the seven CPAs experience lack of food over a 12-month period, but comparatively, Torit's food insecurity rate of 81% was among the most severe. Most households responded to food insecurity by purchasing food, or secondarily gathering wild food/fishing/hunting, relying on relatives, or NGOs (Figure 1.31). Household survey data primarily attributed food shortages to climatic events: droughts and floods (Figure 1.30). Focus groups indicated that *"If it wasn't for the crises, people would be able to produce enough food to be food secure through farming,"* but that conflict has *"demoralized farmers, because for a person to go to the garden, he needs to be escorted by a gunman."* Qualitative data also emphasized environmental factors, market access and prices as food security obstacles. As a result, Torit households may be more permanently turning to other food access sources besides food production.

Figure 1.30

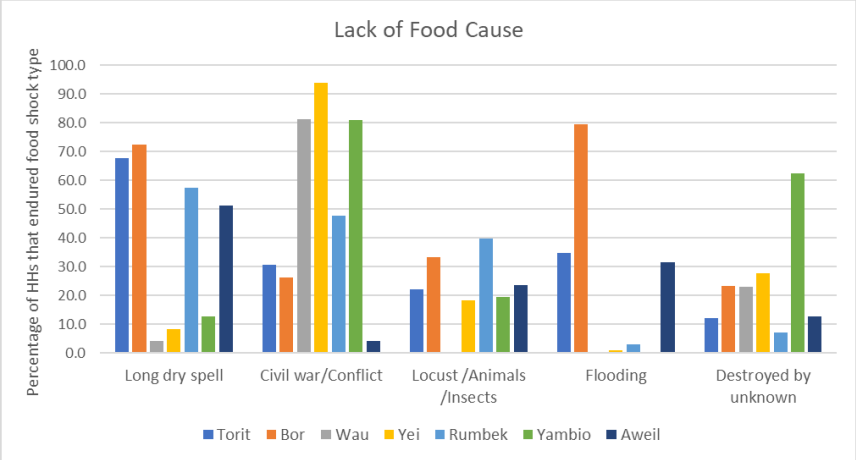
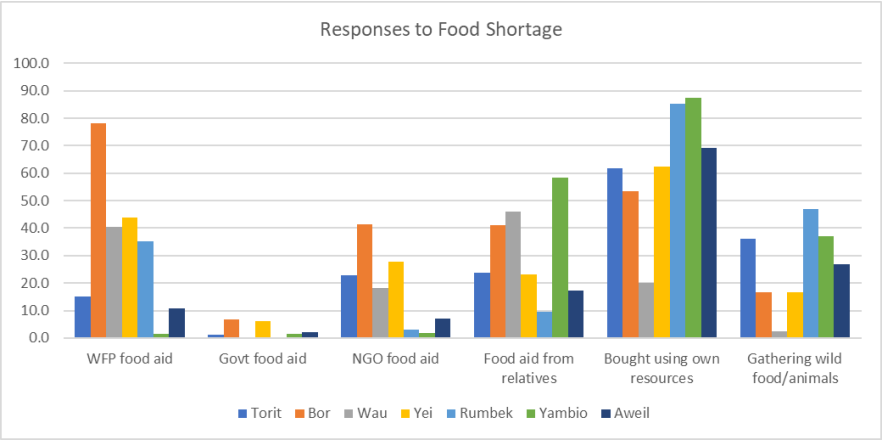


Figure 1.31



Focus groups and interviews suggested that fear prevents fishing, foraging and cultivation. *"When the conflict intensified and the IO* [opposition army] *were very close to the town, it was very difficult for the people to access their farming land… People were restricted to cultivating small gardens next to their houses; these were mostly vegetable gardens."* In certain areas cultivation may have ceased due to conflict: *"This year people have not cultivated, because if you go to the forest, then you can be shot. This year, five people among us have been shot in the forest, until cultivation was stopped."* Depending on when cultivation stopped (or declined) in some communities, the survey data may underrepresent the role of conflict in food shortages due to fear of cultivation. In some regions, foraging is limited because it is *against the law to kill such animals for food."*

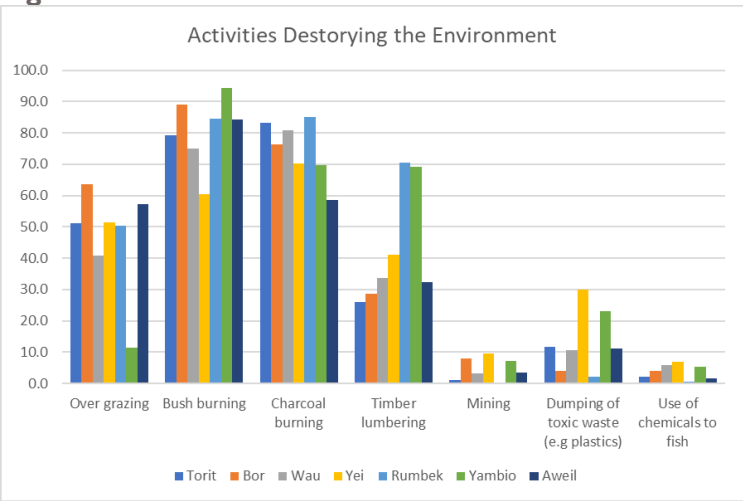
Qualitative responses also echoed the survey data emphasis on climatic shocks, especially flooding and a shift in the rainy season: "*instead of beginning in January or February, rains often do not come now until April*," severely delaying the planting season. Some mentioned that this requires crops that produce quickly (e.g. within 90 days rather than 180 days). This may also require new skills in terms of soil management practices that preserve the "spongy" quality of soils by maintaining higher levels of organic matter and plant roots in the ground – thus enabling soils to better mitigate the effect of both floods and drought. It is not clear whether soil scientists from agencies or government, or farmers with a strong knowledge of soil management, exist within the region to help build knowledge of soil management.

In addition to social and environmental factors that inhibit food security (Figure 1.30), additional human activities disrupt ecosystems, which threatens food security, human health and livelihoods. Some mining, lumber, toxic dumping and fishing chemicals affect Torit, but bush-burning, charcoal-burning and over-grazing are rampant (Figure 1.32). "*The community has resorted to charcoal burning business to raise money to buy food. People go and burn the bushes to get charcoal to bring to the market…The trees are important for rain formation, but all the gangs of cattle raiders are focused on tree cutting to sell to tobacco traders in the areas of Jongole and Turkana."* These human activities further threaten agricultural resilience by deteriorating soil structure, decreasing agricultural productivity and biodiversity, and exacerbating erosion and runoff pollutants (Ozaslan et al., 2015; Vagen et al., 2005). Previous research on South Sudan soils notes the degradation that has been caused by overgrazing, loss of soil nutrients due to poor soil management and

lack of replenishing the soil with organic matter, and the impact of charcoal making that drives loss of trees, woodland and vegetation (Ayoub, 1997).

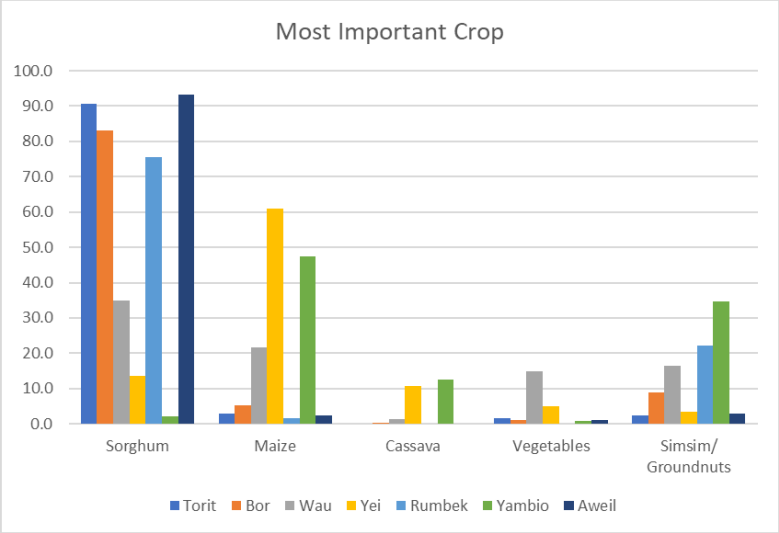
Qualitative data also revealed the threat of fires as well as crops destroyed by climate heat and drought. The forestry department *"creates awareness among the people…advising them to put fire lines to safe guard their farms and homes."*

Figure 1.32



Despite the obvious present value of bush burning and timber lumbering for charcoal, they have various deleterious future effects, so efforts must be made to *prune, plant and preserve* – and encourage applied agroecological or agroforestry knowledge that enhances food security by building healthy soils and ecosystems. While it is difficult to make sweeping generalization about the impact of bush burning due the particularities of ecosystems and the intensity and regularity of burning, the potential effects can be devastating for soil erosion and soil inherent fertility, which is foundational to agricultural food security resilience and to flood and drought resilience (Omotayo & Chukwuka, 2009). Bush burning can severely diminish soil's ability to absorb and retain water. Stripping soil of its sponge-like capacity descreases water access for crops and worsens the impacts of both floods and droughts (Basche & DeLonge, 2017; Hmielowski, 2018). The chemical changes from burning, and the devastation to soil organic matter and plant biomatter in the ground, exacerbate water repellency and erosion, stripping away topsoil as well as essential soil micronutrients, microbiota and fungal life (Hossner & Juo, 1999). Destroying shade systems can further heat and dry out soils, exacerbating erosion and salinization, while weakening roots systems and resilience that comes from biodiverse farm ecosystem (Basche & Edelson, 2017). Previous interventions have demonstrated powerful economic, social and environmental benefits from farmers protecting and planting trees, in effect "re-greening" even semi-arid regions (E van Walsum et al, 2014). These projects may be instructive for South Sudanese regions facing bush-burning, charcoal and timber lumbering pressure. Strong efforts should be made to protect, prune and plant, so that the immediate financial benefits of these activities do not devastate the soil's ability to produce food, and strip away local ecosystem-based livelihoods, food security and resilience.

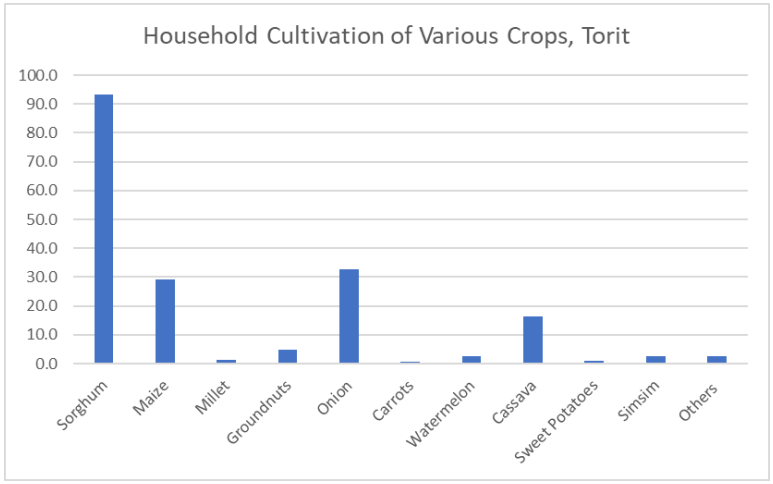
Figure 1.33



With respect to farming, all counties focus on carbohydrate-dense grains as the most important crops. Households in Torit prioritize sorghum almost exclusively. Yet even within households/gardens, Torit's crop diversity is very minimal—drawing attention to the opportunities to improve nutrition outcomes, food security and biodiversity through broader agricultural diversity (Figure 1.34). Lack of diversification can put households and communities at risk when particular crops or varieties fail; it worsens pest threats due to lack of biodiversity, and households may suffer serious malnourishment due to poor dietary diversity. This is especially striking since 80% of Torit's population participates in crop production—most all of them cultivating sorghum almost exclusively.

In contrast, agricultural diversification can reduce household and regional vulnerability to climate and market shocks (Brenda, 2011), and benefit health—provided households diversify and consume nutrient-rich crops and animal-source foods (Kennedy et al., 2010; Hoddinott et al., 2002). Focus groups indicated that "*Farmers are being trained with knowledge on a variety of crops, rather than dwelling on sorghum.*" Diversification efforts may not always meet the intended purpose: "*seeds are distributed to people in villages to plant but however, those in towns wash the seeds and eat them for food.*" Focus groups also called for education around livestock: "*Training should be provided to the cattle keepers on how to add value to their products rather than only slaughtering the cattle for meat only.* Comments called for NGOs to provide tools and provide seeds supplied on time: *"They are supposed to distribute seed before March but they get here in August sometimes even in July…If the seeds could be supplied earlier, then the farmers could plant at the start of the rainy season."* In other cases, farmers have been unable to sells other diverse crops, so the various seeds distributed did *"not help out."*

Figure 1.34



LIVELIHOODS

Several livelihood activities among Torit's working population are differentiated by gender. Females dominate the baking, retail, catering and food processing sectors, while males dominate construction, motor vehicle mechanic work and carpentry industries. Male youth are more likely than older men to work in tailoring, as well as other female-dominated livelihoods. Male youth are more likely that older males to work in carpentry and as motor vehicle mechanics, but less likely to work in construction and livestock production (Figure 1.35). Market livelihood activities varied somewhat less by gender. Alcohol brewing dominates the market labor activities—though even in this activity, there may be gender roles (women predominately brewing). Charcoal burning, firewood collection and petty trade also exist, with very few other industries (Figure 1.36). In this regard, the labor market in Torit is severely undeveloped and limited, and a likely major contributor to conflict and poverty. Unfortunately, the main livelihoods are also extractive or socially destructive. This is of grave concern in Torit due to the severe rates of alcohol abuse and increasing floods and droughts.

Males and females of all ages in Torit generally agreed on the obstacles to livelihood activities, with the exception that males, especially young males, complained more of lack of employment (Figure 1.37). All ages and genders identified lack of capital, followed by unemployment as the primary livelihood obstacle. Qualitative data corroborated the rampant unemployment, along with lack of entrepreneurial innovation and resulting sense of desperation: *There needs to be creativity in order to have resilience …at least create other capacity building projects which involve women such as basket weaving and creative farming skills.* Women expressed more interest in creating businesses: "*Women come back from the bush with grass; they work in groups and encourage competition to increase earnings. Most men drink even the little amount of money they get."* Many in Torit face unemployment: "*Unemployment is also a challenge as majority of the people are not working but rather begging and living under missionaries."* Comments also noted more apathy toward work (in contrast with comments from other CPAs): *"The thing in South Sudan is nobody wants to work, create and build something but everybody wants what's already made, so, you find a lot of hands fighting for what's already available."*

Torit may be particularly caught up in the tension between modern and traditional life: "*Our people want the modern easy life and they spend their whole day in town playing cards and in the evening, they come home and demand food from their wives."* Qualitative data exposed major clashes between traditional life and values and values of the global capitalist world, which cause major divides within communities and generations. "*These days the youth interact with other youth from different places and at times don't follow tradition."* The clash between Western global influence and traditional livelihoods also exhibits in the labor markets; there may also be major differences in pay scales, in part due to the presence of agencies: "*The people working in organizations such as UNMISS are fine because they earn enough money."* The different pay scale cause alert especially due to potential impacts on food security: "*the rest of us can't afford to buy commodities like the organizations' workers."* Qualitative data also articulated an increasing influence of drugs and illicit activities: *Youth rent houses and live alone but you can't tell where they are working or how they are feeding themselves.* Yet others noted it is primarily school children who are working, in efforts to pay their school fees.

Figure 1.35

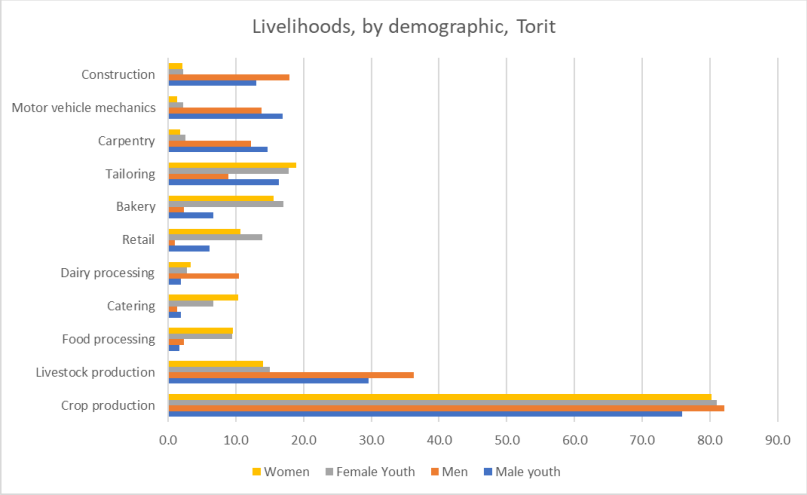


Figure 1.36

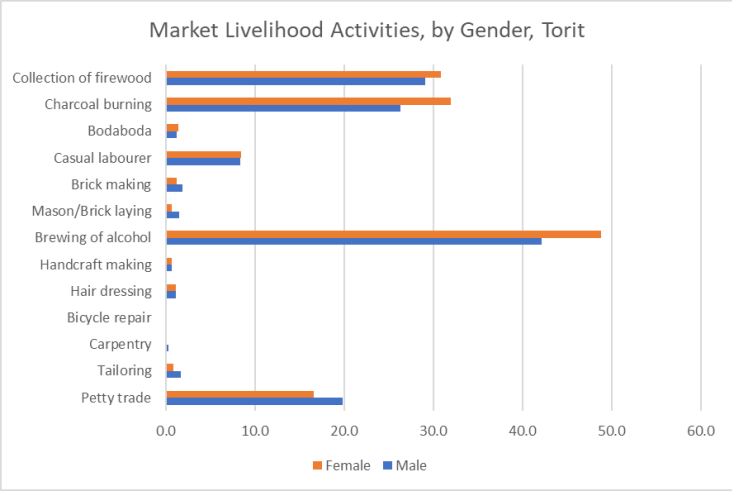
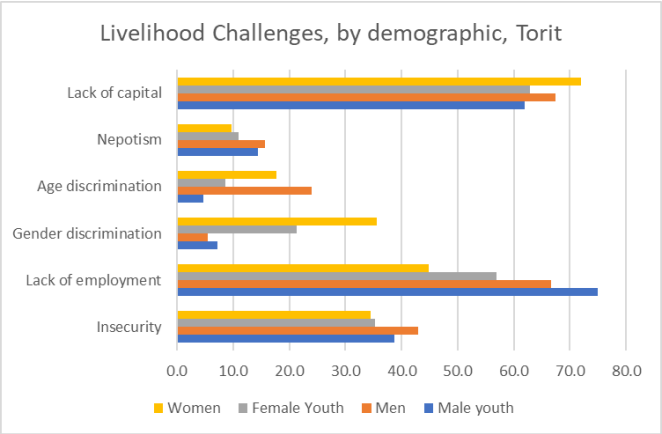


Figure 1.37

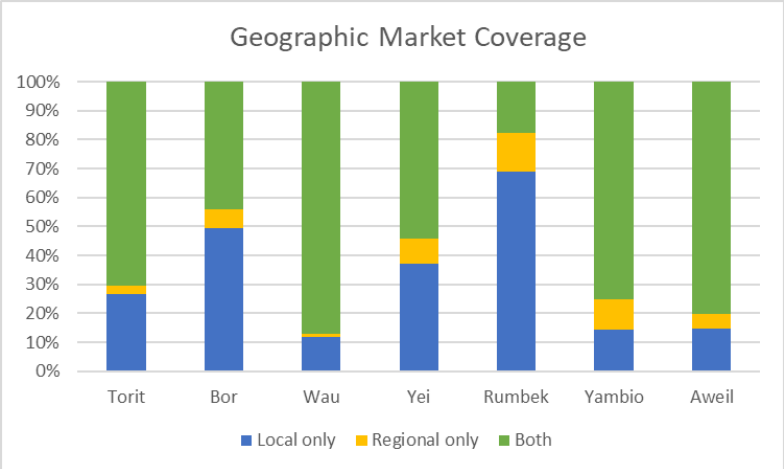


Comments also called for access to capital and tools to encourage crop cultivation, and loans and training especially for women, *"Sometimes the women that are helped just don't have the skills. For instance, if she doesn't have the business skills, then the business will just collapse."* They noted that women's groups have come up with community-run loans, *"collecting contributions for a different member each turn until every member has had a turn."* They noted vocational trainings benefit people "*even if you are not educated."* Some noted the importance of services specifically for refugees returning from camps and resettlement packages: *"Each household can be provided with food enough for about 3 months and also seeds and tools to enable them produce their own food."*

MARKET ACCESS

Only 55% of surveyed households have regular access to a common open market, the lowest of any CPA. Among those with access, nearly all (98%) have daily access. Most markets are both regional and local (Figure 1.38). Given the high dependency on purchasing food in times of food insecurity, the limited market access—coupled with the near complete dependence on sorghum—causes great alarm.

Figure 1.38



Particularly remote communities vulnerable to shocks, they may not be well-suited to conventional agricultural development tactics. In the absence of well-functioning markets with consistent access to agricultural inputs and consumer demand, farmer adoption of typical production-enhancing technologies could weaken resilience over the long-term because many modern technologies fail to improve long-term soil health, and biodiversity-based pest management. Qualitative data underscore the ramifications of limited access, such as *"challenges with transport causing different prices in different areas for the same food item."* Comments noted the volatile prices, inflation tied to the dollar and the need to reopen the roads. They also tied price volatility to migration: *When food prices are high, people move to the camps and when they reduce, they come back to towns."*

Focus group remarks also highlighted the role of trade, sometimes with contrasting options: "*We need to concentrate on agriculture and reduce the food we buy from Uganda…for the very first time, local produce has been brought to the markets by the rural people; the has greatly improved the lives of the people both in towns and rural areas because it reduced importation of food.* Others believed open trade best nurtured other businesses: *"my advice is government should reduce taxes on imports because these are businessmen and they won't return if the business isn't profitable."* But others noted poor payment for exports "*Animal products are exported to other countries at high prices compared to the pennies paid to local farmers,"* or elevated the importance of "*local farmers bringing produce at prices lower than imported produce."* There was general concern over foreign influence's impact on the market: "*The government should set strict regulations regarding local trading, that all local trading be done using local currency… hard currency should be gotten from the banks in order to avoid dollar inflation on streets.* Some saw the benefits of new buyers and sellers: *"The markets are flocked by foreigners trading and thus the local people should be equipped with entrepreneurship skills to own their own businesses."*. Like some other CPAs, some related identity and meaning to local self-sufficiency: "*If our country could produce most of what the people need and cut down on the dependence on imports people would be happier."*

Finally, there was awareness of the dependency on aid and hunger for self-sufficiency in production and in agricultural knowledge: "*How long will the humanitarian organizations continue providing services such as ready food to the peoples? Rather they should come up with initiatives of training people on how to manage themselves…We don't want service providers to be brought from outside. Rather, we want agricultural institutions and universities to train our own people to deliver the services."* Some requested in the meantime that *"organizations take people for tours in other areas so that they can learn from others."* Visits in which farmers share with each other to learn could also invite opportunities for women to teach, and women and girls to learn—even in situations where they are not given the opportunity to attend formal school. Supporting farmer-to-farmer education networks in Torit could continue to bear fruit long into the future, even as long-term development aid investments may fluctuate. Previous interventions supporting holistic farmer-to-farmer teaching have simultaneously strengthened agricultural productivity, improved environmental factors, improved nutrition and fostered healthy community—including stronger gender relations (DeLonge et al., 2016; Kerr et al., 2013; Gubbels, 2011).

MEASURING AND EXPLAINING RESILIENCE

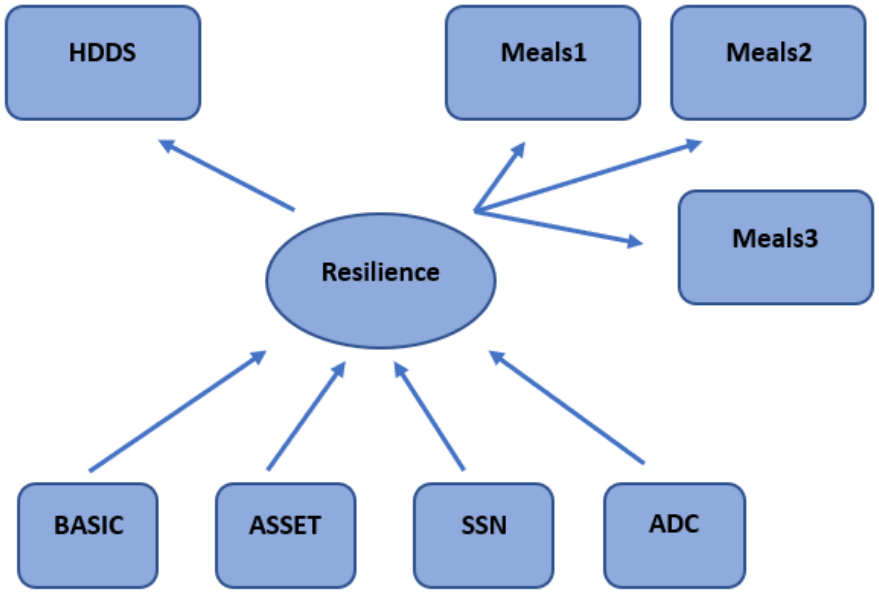
2.1. METHODOLOGY AND DATA

We adapt the FAO's Resilience Index Measurement and Analysis-II (RIMA-II) methodology, which, along with its predecessor RIMA, has been implemented in around 15 African countries to estimate households' ability to maintain well-being in the face of shocks (FAO, 2015; FAO, 2016). In RIMA and RIMA-II, resilience is estimated as an index, based on observed indicators of assets, livelihoods, and access to services and safety nets, which are organized into pillars.

It should be noted that whenever the RIMA/RIMA-II methodology is applied to cross-sectional data, it would be accurate to interpret the resulting measure in terms of capacity to prevent vulnerability rather than resilience per se. Indeed, because resilience is a dynamic concept, it usually is defined as the ability to maintain a minimum level of well-being despite stressors or shocks. Thus, it is best measured with panel or longitudinal data in which changes in well-being over time, as a result of shocks, are observed. In a cross-sectional setting, the RIMA-II methodology measures the contribution of different variables to current well-being (usually represented by food security outcomes), rather than measuring the maintenance or improvement of well-being over time as a result of shock. In the remainder of this section, we will refer to the latent variable estimated as "resilience," but it is better understood as a capacity index associated with household and location characteristics, grouped under the pillars, which contribute to resilience and ultimately to the desirable well-being outcomes.

Figure 2.1 demonstrates the resilience measurement framework graphically.

Figure 2.1. Resilience measurement framework



Source: Authors, based on FAO (2016)

Note: BASIC—Access to Basic Services; SSN—Social Safety Nets; ADC—Adaptive Capacity; RES--Resilience; HDDS—Predicted Household Dietary Diversity Score; Meals1—Per capita number of cooked meals consumed the

previous day by children over 12 and adults; Meals2—per capita number of cooked meals consumed the previous day by children aged 6-12 years; Meals 3—Per capita number of cooked meals consumed the previous day by children aged 2-5 years.

Following the computation of the resilience index we use regression analysis to estimate the effects of household characteristics and other factors on resilience. To account for the social and institutional environment, we construct variables to represent the quality of governance as perceived by households, strength of institutions, and exposure to conflict, based on a set of underlying variables.

We apply the RIMA-II methodology to cross-sectional household survey data collected by Management Systems International (MSI) in the 7 Partnership Areas (PAs) in 2018 to estimate the resilience of households in Torit. Like FAO, we use indicators of food security as the outcomes of resilience. Data were collected on household characteristics and livelihood sources; the availability of livelihood opportunities; weather shocks and conservation; food security and coping strategies; health and health care; community participation by women and children and community organization; violence and insecurity; conflict; and perceptions of the quality of governance and the causes of conflict. The variables constituting each pillar are listed in Table 2.1.[1]

Table 2.1. Resilience pillars and indicators

TABLE 2.1. RESILIENCE PILLARS AND INDICATORS	
PILLAR	INDICATORS
Access to Basic Services	**Education:**
	Distance to primary school
	Distance to secondary school
	Participation in vocational training
	Existence of agricultural extension workers
	Markets:
	Access to a common open market
	Market located along trade routes
	Health services:
	Number of health facility types where household members go when sick
	Health facility provides free care

[1] The specific lists of variables used for resilience analysis in each PA are subsets of the list in Table 2, as some variables were dropped in some PAs due to missing values or other issues.

	Time to reach the health facility
	Respondent was satisfied with quality of health service
	Respondent was served by a qualified person
	Time spent waiting until attended to
	Health provider treated respondent with respect
	Respondent was served on time
	Health personnel give respondent enough time
	Respondent was provided with enough information
Social Safety Nets	Access to remittances from within South Sudan
	Access to remittances from outside of South Sudan
	Number of ways in which household overcame lack of food (e.g., food aid from WFP, government, friends and relatives, etc.)
	Knowledge of organizations doing humanitarian / development work in the community
Assets	Predicted landholdings
	Predicted numbers of wheelbarrows; beds; sponge mattresses; chairs; tables; radios; televisions; cellphones; mosquito nets; motor bikes; bicycles; flat irons; stoves; solar panels
Adaptive Capacity	Educational attainment of household head
	Number of types of fuel used by household for cooking
	Number of agriculture-related livelihood activities household members are involved in
	Number of non-agriculture-related livelihood activities household members are involved in
	Number of formal employers of household members
	Number of crop types planted in 2018
	Access to information to warn about natural disaster

The variables used to construct the institutions and governance scores are listed in Table 2.2. The governance score is composed of variables representing respondents' perceptions of the quality of the governments' performance in different areas, including creating jobs, reducing crime and corruption,

improving access to education, etc. Thus, the governance score directly measures perceptions and can serve as a proxy for actual governance quality.

Table 2.2. Institutions and Governance indicators

TABLE 2.2. INSTITUTIONS AND GOVERNANCE INDICATORS	
PILLAR	INDICATORS
Institutions	Number of organizations/groups named that support this community
	Number of community institutions named that affect households' daily lives
	Presence of a traditional leader
	Frequency of community meetings held by traditional leaders
Governance	Respondents' ratings of government's efforts to create jobs; keep prices down; reduce crime; improve basic health services; combat HIV/AIDS; address educational needs of the country; provide water and sanitation services; ensure that everyone has enough food; fight corruption; resolve violent conflict between communities; maintain roads and bridges; provide a reliable supply of electricity; defend the country

Following FAO (2016), we implement the RIMA-II methodology using four pillars: i) Adaptive Capacity, representing households' ability to absorb and adapt to shocks and stressors; ii) Social Safety Nets, representing the availability of formal or informal social protection and other resources to lessen the impact of shocks; iii) Assets, representing a households' physical assets and income; and iv) Access to Basic Services, indicating the households' access to and use of services such as education, extension, markets, and health facilities. Since the MSI survey data does not include detailed information on assets, we used predicted values of household assets and landholdings based on recorded assets and landholdings of similar households in the same areas from data collected by WFP and FAO. For each PA, we use the WFP/FAO data to run truncated tobit regressions for landholdings and numbers of different assets owned (e.g. mattress, cell phone, bicycle, etc.), using as explanatory variables location attributes and household characteristics which are also recorded in the MSI data (e.g., age, sex and education level of household head, type of toilet, and main water source). We then use the regression results to predict level of each asset for households in the same PA in the MSI data, based on household characteristics. These predicted land and asset levels are used to calculate the Assets pillar.

The pillars are indices composed of several observed variables; the computed pillars are then used to estimate a resilience index as a latent variable. Theoretically, all pillars should contribute positively to household well-being via the latent variable measuring resilience. However, it should be noted that in practice, the construction of each pillar index is sensitive to the extent to which the indicators composing the pillar are correlated with each other. When pillar variables are negatively correlated, it becomes difficult to predict the overall effect of the pillar on outcomes; for this reason, we drop variables if necessary to avoid negative correlations between pillar variables.

As pointed out above, the RIMA-II methodology as implemented by the FAO measures "food security resilience," or the ability to maintain food security in the face of stressors and shocks; food security indicators are functions of resilience. The MSI data contains only one binary variable indicating whether a given household lacked food within the past 12 months. This food security measure has very little variation across households and thus is not very informative for the purposes of resilience analysis. The proportion of households which experienced lack of food in the past 12 months was over 75 percent in four out of the seven PAs, which reflects the widespread food insecurity in the priority areas.

Instead, we opted to use four predicted food security variables—the Household Diet Diversity Score (HDDS) and the numbers of meals consumed by different age groups—as the resilience outcome variables. The HDDS measures the number of food groups consumed by the household in the past 24 hours; the variables on meals measure the per capita number of warm and cooked meals consumed in the previous day by children aged 2-5 years, children aged 6-12 years, and children over 12 and adults. These variables were measured in the data collected by WFP/FAO in the same PAs and were predicted for each household in MSI dataset based on the values of similar households in the WFP/FAO data using the methodology employed for the predicted Asset variables described above. In addition to the greater variation, the predicted variables offer richer information than the binary food security variable in the MSI data. Dietary diversity variables such as the HDDS have been found to be good predictors of undernutrition indicators and to reflect the influence of shocks and stressors (Headey and Ecker, 2013).

2.2. PILLAR CONSTRUCTION

In Table 2.3, we report the weight[2] of each variable in the Access to Basic Services pillar. Participation in vocational training and access to free health care play the strongest roles, with access to extension services contributing less to the pillar.[3] Access to health care is relatively widespread in Torit, with nearly three-fourths of households using a health facility that provides free health care. Access to other services appears to be more limited: close to 10 percent of households had at least one member who had participated in vocational training, while nearly 20 percent knew of agricultural extension workers to provide advice on farming.

TABLE 2.3. ROLE OF VARIABLES IN PILLAR ESTIMATION: ACCESS TO BASIC SERVICES

PILLAR VARIABLES	WEIGHT	MEAN VALUE
Participation in vocational training	0.447	0.097
Health facility provides free care	0.425	0.725
Existence of agricultural extension workers	0.181	0.193

Note: Unless otherwise noted, variables are 0-1 binary indicators.

[2] Pillars are constructed using principal component analysis; the weights of each variable are the factor loadings of the first factor.

[3] Only variables used in the Torit analysis are shown in Tables 2.3-2.6. Additional variables shown in Table 2.2 were not used due to high numbers of missing values, negative correlations with other pillar variables, and other factors.

The Assets pillar (Table 2.4) is constructed from the predicted numbers of household assets, based on asset holdings of similar households in the more detailed FAO-WFP dataset. The predicted number of sponge mattresses makes the largest contribution to the pillar, followed by the predicted number of beds and predicted number of stoves. Most households did not own these assets. Households had higher access to stoves than to beds, with 43 percent of households owning at least one stove; only 17 percent owned one or more beds. 80 percent of households had no sponge mattresses and 83 percent had no beds.

TABLE 2.4. ROLE OF VARIABLES IN PILLAR ESTIMATION: ASSETS

PILLAR VARIABLES	WEIGHT	MEAN VALUE
Predicted numbers of sponge mattresses	0.995	0.285
Predicted number of beds	0.988	0.215
Predicted number of stoves	0.819	1.744

The variables that contribute the most to the Adaptive Capacity pillar are those related to agricultural livelihood strategies: the number of crops planted and the number of agricultural livelihood activities (Table 2.5). The number of nonagricultural livelihood activities made a smaller contribution to the pillar. On average, surveyed households planted 1.8 crop types, ranging from 0 to 6. Sorghum was the most commonly planted crop by far, grown by around 87 percent of households; other common crops included maize, onion and cassava. Households were involved in an average of 1.9 agricultural livelihood activities, ranging from 0 to 6; these included planting different crops as well as (to a lesser extent) raising goats, cattle, sheep or other livestock. Households were involved in an average of 0.9 nonagricultural livelihood activities, ranging from 0 to 5; half of households engaged in one nonagricultural activity, while around 30 percent of households did not engage in any. The most common nonagricultural livelihood activities included brewing alcohol, collecting firewood, petty trade, and bodaboda (bicycle or motorcycle taxi).

TABLE 2.5. ROLE OF VARIABLES IN PILLAR ESTIMATION: ADAPTIVE CAPACITY

PILLAR VARIABLES	WEIGHT	MEAN VALUE
Number of crop types planted	0.794	1.780
Number of agricultural livelihood activities	0.791	1.865
Number of nonagricultural livelihood activities	0.066	0.947

Knowledge of organizations doing humanitarian or development work in the community and access to remittances from outside of South Sudan carried equal weight in the Social Safety Nets pillar (Table 2.6). Overall, access to social safety nets appears to be low among surveyed households in Torit. While slightly over half of surveyed households knew of organizations performing humanitarian or development work, less than 2 percent of households received any remittances from outside the country.

TABLE 2.6. ROLE OF VARIABLES IN PILLAR ESTIMATION: SOCIAL SAFETY NETS

PILLAR VARIABLES	WEIGHT	MEAN VALUE
Knowledge of organizations doing humanitarian / development work	0.520	0.514
Access to remittances from outside South Sudan	0.520	0.017

Note: Variables are 0-1 binary indicators.

2.3. RESULTS AND DISCUSSION

The results of the structural equation model for Torit are presented in Table 2.7. As expected, the estimated resilience capacity index has a positive effect on food security, as measured by the predicted Household Dietary Diversity Score (HDDS) and the predicted number of meals consumed by two younger age groups. The effects on household dietary diversity were larger in magnitude than the effects on the number of meals consumed.

Two of the four pillars, Access to Basic Services and Assets, show significant effects on the resilience index. The impacts of the pillars on resilience are not linear: the negative coefficients on the Access to Basic Services pillar score and the positive coefficient on the square term indicate that the pillar score has a quadratic[4] relationship with the resilience score. This suggests the existence of a threshold value that must be reached before increases in the pillar value begin to affect resilience positively. The Assets pillar shows the opposite pattern, suggesting that higher values of this pillar affect resilience negatively after a certain point.

Table 2.7. Resilience structural equation model results for Torit

TABLE 2.7 RESILIENCE STRUCTURAL EQUATION MODEL RESULTS FOR TORIT

VARIABLES	(1) RESILIENCE	(2) HDDS	(3) MEALS1	(4) MEALS1	(5) MEALS1
BASIC	-0.197**				
	(0.0781)				
BASIC²	0.300***				
	(0.0911)				
ASSET	1.045***				
	(0.110)				
ASSET²	-0.580***				
	(0.124)				
SSN	0.0136				
	(0.0870)				
SSN²	0.0233				
	(0.141)				
ADC	0.0193				
	(0.143)				
ADC²	-0.191				
	(0.163)				
RES		1	0.0574	0.192**	0.410***
		(0)	(0.0810)	(0.0904)	(0.0775)
Constant		0.301***	0.886***	0.190***	0.297***
		(0.0305)	(0.0162)	(0.0211)	(0.0178)
Observations	414	414	414	414	414

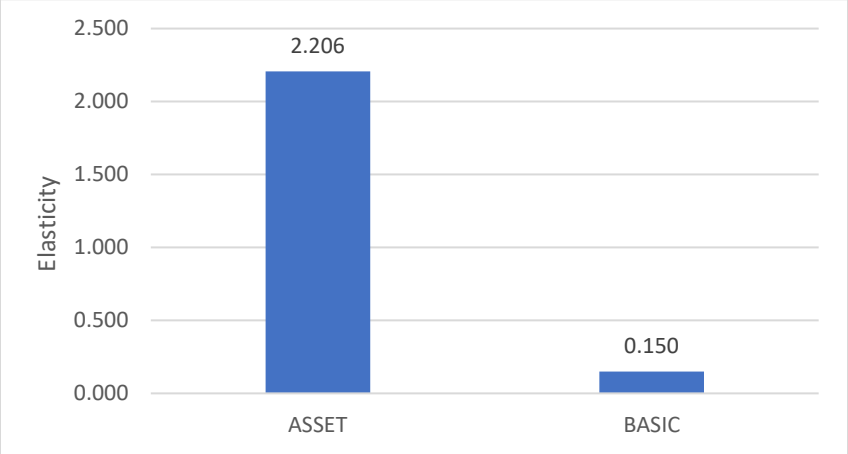
LR test of model vs. saturated: chi2(26) = 160.96, Prob > chi2 = 0.0000
Standard errors in parentheses

[4] Of the following functional form $y = a + bx + cx^2$; it follows that elasticity is given by $(b + 2c\bar{x}) * \frac{\bar{x}}{\bar{y}}$, where $\bar{x}$ and $\bar{y}$ are averages.

*** p<0.01, ** p<0.05, * p<0.1
Note: Pillar variables are expressed as indices ranging from 0 to 1. BASIC—Access to Basic Services; SSN—Social Safety Nets; ADC—Adaptive Capacity; HDDS—Predicted Household Dietary Diversity Score; Meals1—Predicted per capita number of cooked meals consumed the previous day by children over 12 and adults; Meals2—Predicted per capita number of cooked meals consumed the previous day by children aged 6-12 years; Meals 3—Predicted per capita number of cooked meals consumed the previous day by children aged 2-5 years.

To better capture the response of resilience to changes in pillar scores, we compute elasticities of the resilience index with respect to the Access to Basic Services and Assets pillars (Figure 2.2). The quadratic relationships of the pillar scores with resilience suggest that changes in pillar scores affect resilience differently at different value ranges; however, elasticities measured at the sample means are positive for both pillars, indicating that on average increases in pillar scores are expected to increase estimated resilience for households. The effect of assets on resilience is especially large, with a one percent increase in the Asset pillar value expected to increase resilience by 2.21 percent. This suggests that the majority of households in the sample have scores in the range where increases in the pillar value increase resilience. The response in resilience following a one percent increase in the Access to Basic Services pillar is estimated at 0.15 percent.

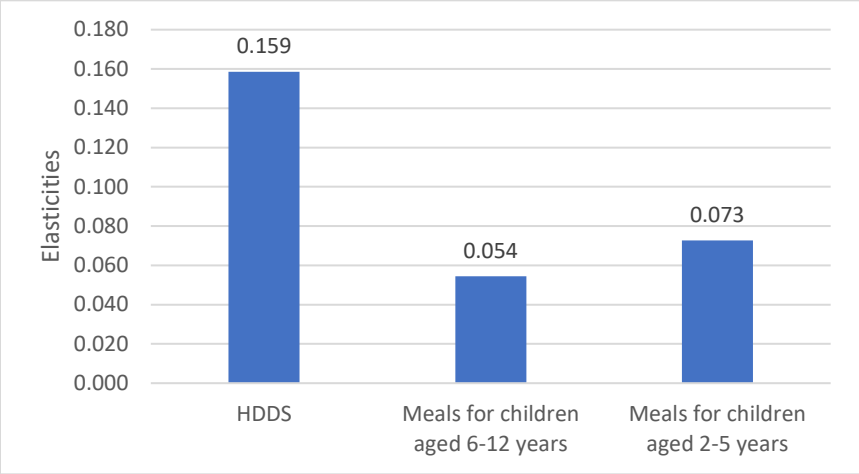
Figure 2.2. Elasticities of resilience with respect to pillar values (measured at sample means)



Source: Authors, from modeling results
Note: BASIC—Access to Basic Services

As expected, the elasticities of food security measures with respect to the resilience index are positive (Figure 2.3). The Household Dietary Diversity Score (HDDS) is the most responsive to increases in resilience, with a one percent increase in the resilience index expected to increase the HDDS by 0.16 percent. The number of meals for young children is slightly more responsive to changes in resilience than the number of meals for older children. Resilience did not show a significant effect on the numbers of meals consumed by teenagers and adults (Table 2.7).

Figure 2.3. Elasticities of food security with respect to resilience



Source: Authors, from modeling results
Note: HDDS—Food Consumption Score

Box 1. Drivers of Resilience: Pillars and Underlying Variables

The four pillar scores represent households' attributes in the areas of Access to Basic Services, Assets, Adaptive Capacity, and Social Safety Nets, respectively. Each pillar is calculated based on indicators reflecting aspects of the overall concept represented by the pillar. For households in Torit, the **Assets and Access to Basic Services pillars** are found to contribute significantly to the resilience index. The effects of increases in the pillar values on resilience are not linear, with the pillar scores affecting resilience differently at different ranges. However, at average pillar score levels, increases in pillar scores are expected to impact resilience positively, with especially high increases for Assets.

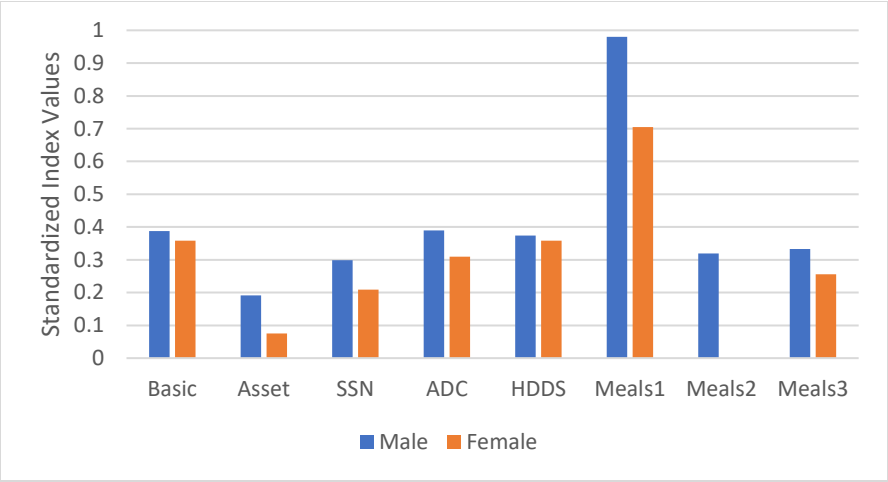
While social safety nets should normally be expected to increase households' resilience, there are several reasons for which the analysis might fail to capture these effects. In particular, the presence of social safety nets may be more pronounced in areas or for households with lower resilience. The social safety nets pillar is constructed from variables on remittances received by households; migration rates and therefore remittances received may be higher among poorer households. If the resilience-strengthening benefits of the remittances are not enough to outweigh the households' overall lower resilience, then higher levels of social safety nets could be associated with lower resilience scores.

To better understand how to increase resilience, it is important to look at the variables making up the Assets and Access to Basic Services pillars and their weights in the pillar scores, which reflect their relative importance. The **predicted numbers of sponge mattresses and beds owned by households** made the largest contributions to the Assets pillar, followed by the predicted numbers of stoves. **Participation in vocational training and the availability of free health care** play the largest roles in the Access to Basic Services pillar, with access to extension services also contributing to the pillar.

As shown in Figure 2.4, female-headed households in Torit have worse outcomes than male-headed households for all of the food security indicators. This is more the case for quantities consumed than for dietary diversity: female-headed households have only slightly lower scores than male-headed households

for the Household Dietary Diversity Score but show substantively lower predicted numbers of meals consumed for all age groups, particularly for teenagers and adults and for older children. Female-headed households also have lower scores than male-headed households for all pillars, with the largest disparity in the Assets pillar.

Figure 2.4. Average pillar values and food security scores for male- and female-headed households

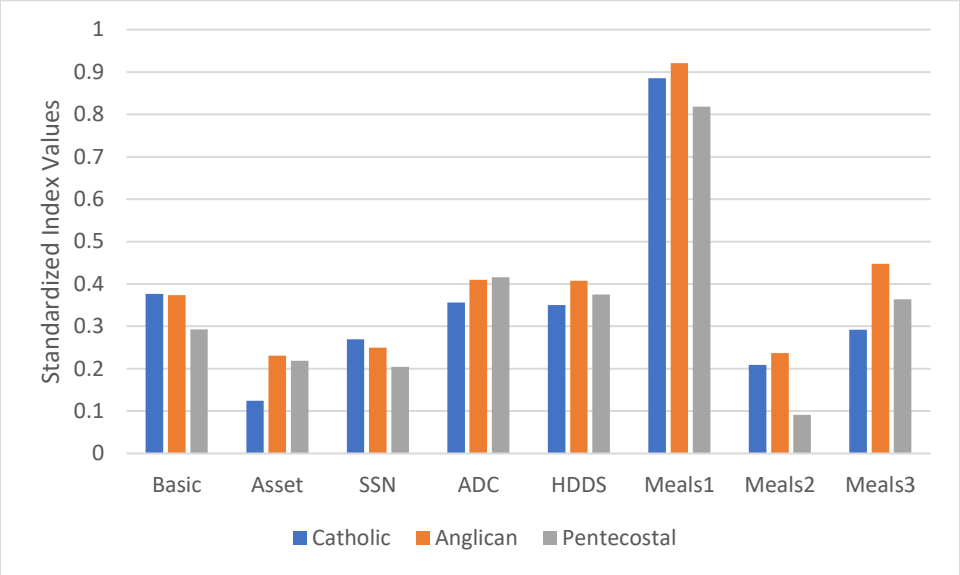


Source: Authors.

Note: BASIC—Access to Basic Services; SSN—Social Safety Nets; ADC—Adaptive Capacity; HDDS—Household Dietary Diversity Score; Meals1—Per capita number of cooked meals consumed the previous day by children over 12 and adults; Meals2—per capita number of cooked meals consumed the previous day by children aged 6-12 years; Meals 3—Per capita number of cooked meals consumed the previous day by children aged 2-5 years.

A large majority (84 percent) of surveyed households in Torit identified themselves as Catholic. Around 9 percent of households identified as Anglican and 5 percent as Pentecostal; very few identified themselves as Adventist or Muslim. Anglican households show higher scores for all food security indicators than Catholic and Anglican households. No clear patterns emerge for differences in pillar scores by religion. Catholic households had the highest scores on the Access to Basic Services and Social Safety Nets pillars, but the lowest scores on the Assets and Adaptive Capacity pillars.

Figure 2.5. Average pillar and food security values by religion

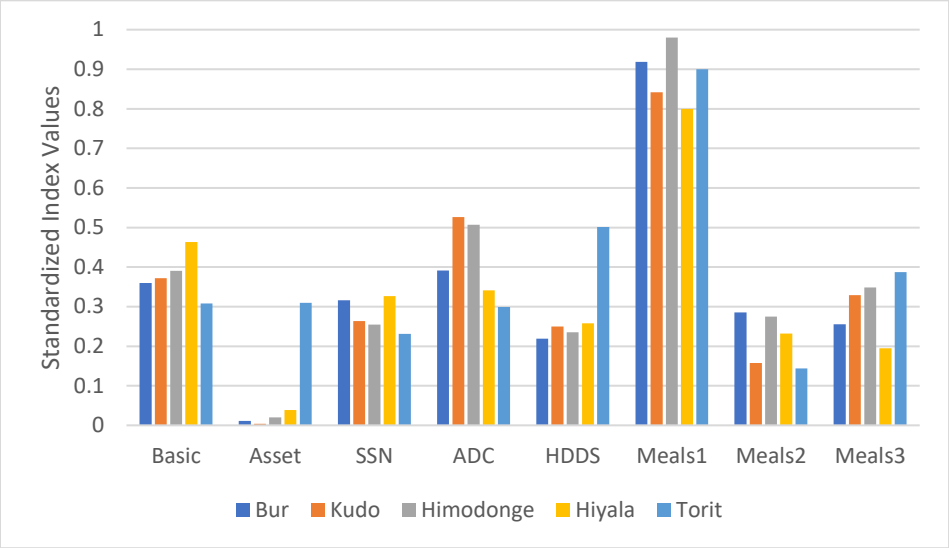


Source: Authors.

Note: BASIC—Access to Basic Services; SSN—Social Safety Nets; ADC—Adaptive Capacity; HDDS—Household Dietary Diversity Score; Meals1—Per capita number of cooked meals consumed the previous day by children over 12 and adults; Meals2—per capita number of cooked meals consumed the previous day by children aged 6-12 years; Meals 3—Per capita number of cooked meals consumed the previous day by children aged 2-5 years. Results for Adventist and Muslim households not shown due to small sample sizes.

The surveyed households are located in approximately 9 different payams (the geographic division below county). Figure 2.6 shows average pillar scores and food security values for the five largest payams: Torit payam, with 39 percent of sample households; Hiyala, with 23 percent; Himodonge, and Bur, each with 12 percent; and Kudo, with 5 percent. The remaining 9 percent of households reside in Imurok, Ifwofu, Nyong, and Anyidi payams. Households in Torit payam had the highest predicted values for the Household Dietary Diversity Score, as well as for the number of meals consumed by young children. Torit also had much higher predicted asset values than households in other payams. However, no other clear patterns emerge with respect to pillar scores across payams.

Figure 2.6. Average pillar and food security values by payam



Source: Authors

Note: BASIC—Access to Basic Services; SSN—Social Safety Nets; ADC—Adaptive Capacity; HDDS—Household Dietary Diversity Score; Meals1—Per capita number of cooked meals consumed the previous day by children over 12 and adults; Meals2—per capita number of cooked meals consumed the previous day by children aged 6-12 years; Meals 3—Per capita number of cooked meals consumed the previous day by children aged 2-5 years.

2.4. RESILIENCE DETERMINANTS

To determine the drivers of resilience beyond the pillar variables used to estimate the resilience index, we perform regression analysis using household characteristics and other variables. We first standardize the resilience index so that all values fall between 0 and 1. The first column of Table 2.8 displays the results of regression analysis exploring the effects of the gender and age of the household head, religion of the household, and payam on the resilience score. Female-headed households show significantly lower resilience than male-headed households, reflecting these households' lower pillar scores and worse performance on food security indicators (Figure 4). This echoes the findings of previous RIMA analyses in the Karamoja region of Uganda and in Somaliland, which found female-headed households to have lower resilience scores in most areas (FAO, 2017; FAO, 2018).

TABLE 2.8. DETERMINANTS OF RESILIENCE

VARIABLES	(1)	(2)
Female	-0.0458**	-0.0463**
	(0.0190)	(0.0191)
Age 26-35	-0.0126	-0.0107
	(0.0314)	(0.0313)
Age 36-55	-0.0877***	-0.0849***
	(0.0293)	(0.0292)
Age >55	-0.168***	-0.164***
	(0.0339)	(0.0339)
Imurok	0.0501	0.0446
	(0.0519)	(0.0518)
Kudo	-0.0313	-0.0295
	(0.0501)	(0.0499)
Himodonge	-0.00367	-0.00503
	(0.0374)	(0.0372)
Hiyala	0.0435	0.0533*
	(0.0313)	(0.0317)
Ifwotu	0.170***	0.168***
	(0.0569)	(0.0567)
Nyong	0.366***	0.369***
	(0.0671)	(0.0672)
Torit	0.292***	0.295***
	(0.0295)	(0.0298)
Governance		-0.0435
		(0.0452)
Institutions		-0.104
		(0.0635)
Constant	0.312***	0.341***
	(0.0355)	(0.0396)
Observations	385	385

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: Results for religion not shown; results for Anyidi payam not shown due to low numbers of observations.

Households' religion did not significantly affect resilience (not shown). However, the age of the household head matters: households with heads over 35 years old had significantly lower resilience values than households with heads aged 15–25, the omitted category. Households in Ifwotu, Nyong and Torit payams had higher resilience scores than households in Bur, the omitted payam category, reflecting the higher scores of households in Torit payam on food security indicators. In column 2 of Table 2.8, we add scores representing the strength of institutions and the perceived quality of governance. Each score ranges from 0 to 1. The governance and institutions indicators do not have a significant effect on the resilience score in Torit.

Box 2. Drivers of Resilience: Demographics and Environmental Variables

Household demographic characteristics also affect their resilience. Female-headed households have lower resilience than male-headed households, as well as lower scores for all pillars, with the largest gap in Asset pillar scores. Female-headed households also show lower values for all of the food security indicators examined, particularly for numbers of meals consumed by household members. Households with heads aged over 35 years have significantly lower resilience than those with the youngest heads of 25 years and under. Geography is also associated with differences in resilience, with significantly higher resilience among households in Ofwotu, Nyong and Torit payams (the administrative division below county) than households in Bur payam. The analysis also tested the effects of environmental factors—namely the quality of governance and the strength of institution—on household resilience; however, these factors were not found significant in Torit.

INTERVENTION OPTIONS

There are many options for interventions to improve food security by improving households' resilience. To explore in more detail the opportunities for increasing resilience through the Access to Basic Services and Assets pillars, we calculate the threshold values[5] because of the pillars' quadratic relationships with resilience. Figure 2.7 compares the threshold values for each pillar with the mean pillar values among sample households. With observed pillar scores normalized to fall between 0 and 1, the identified threshold values for the Access to Basic Services and Assets pillars are 0.33 and 0.90, respectively.

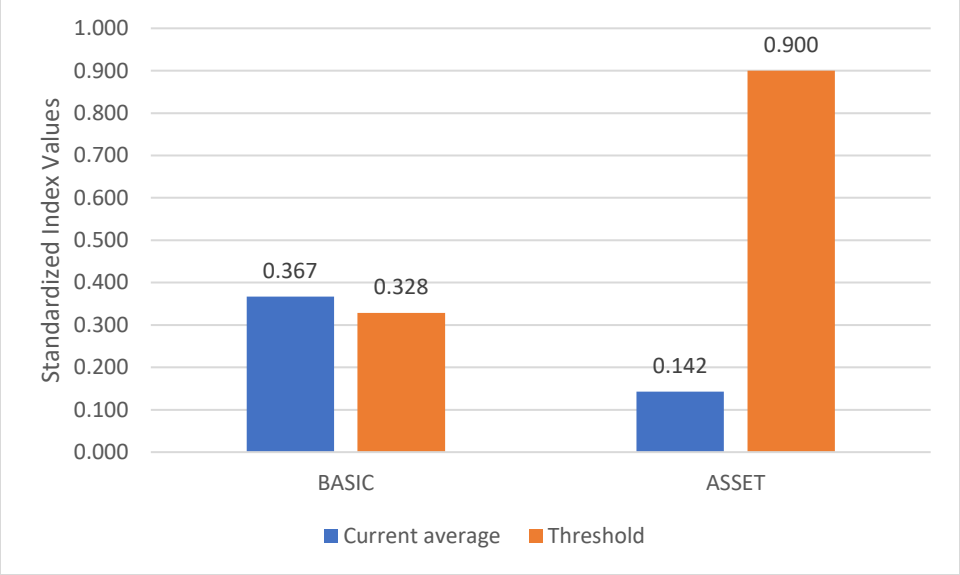
For Access to Basic Services, the average score among sample households, 0.37, is slightly over the threshold beyond which increases in scores are expected to positively affect resilience. This suggests that efforts to provide services in Torit—namely vocational education, free health care, and agricultural extension services—are contributing to increased household resilience and food security. However, there is also likely to be a sizeable group of households in Torit with pillar scores moderately below the threshold. Expanding access to services sufficiently to move more households above the threshold is a key opportunity for interventions to contribute to increased resilience.

The RIMA estimation produced unexpected results for the Assets pillar, suggesting that increases in pillar values positively affect resilience below a threshold but then begin to have negative effects at higher levels. The existence of an upper limit may be related to the estimation procedure used to predict asset values for households in the dataset and requires further investigation. However, we can note that the calculated threshold value for the Asset pillar is far above the average pillar score among sample households. Given this fact, as well as the large positive elasticity of resilience with respect to assets calculated at sample means (Figure 2.2), it seems most likely that efforts to increase asset levels in Torit would have a positive effect on household resilience and food security, despite the potential upper threshold. Interventions

[5] With resilience estimated according to the following functional form $y = a + bx + cx^2$, it follows that the minimum value of y corresponds to $x = \frac{-b}{2c}$. This x value is the threshold after which increases in x begin to affect the value of y positively.

therefore should focus on increasing asset levels, particularly for households with the lowest levels, as well as improving access to basic services.

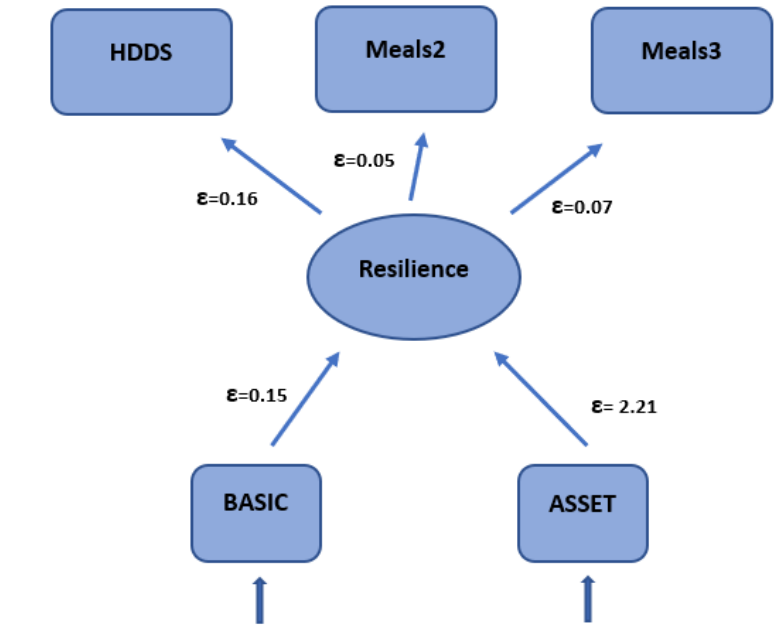
Figure 2.7. Threshold and average pillar values



Source: Authors, from modeling results
Note: BASIC—Access to Basic Services

Figure 2.8 provides the complete pathway to resilience and food security for Torit, based on RIMA estimation results. The listed variables define the number, magnitude and nature of pathways policymakers and development partners ought to consider when planning to improve food security by increasing household resilience.

Figure 2.8. Estimated pathways to resilience and food security



Pillar variables	Weights
Participation in vocational training	0.447
Health facility provides free care	0.425
Existence of agricultural extension workers	0.181

Pillar variables	Weights
Predicted no. of sponge mattresses	0.995
Predicted no. of beds	0.988
Predicted no. of stoves	0.819

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ANNEX: DETAILED METHODOLOGY

We estimate the resilience measure in two steps, first by constructing the pillars from observed data, and second by estimating the resilience index based on the pillars and outcomes. We estimate the pillars using principal component analysis (PCA). Given that the variables composing the pillars are discrete, we first estimate polychoric correlations between the variables and then apply PCA to the correlation matrix.[6] The pillars are then standardized using the min-max procedure[7] so that all values fall between 0 and 1.

Following the pillar estimation, we estimate resilience as a latent variable based on the pillars and on four food security variables using structural equation modeling and a maximum likelihood estimator. We include the quadratic terms for each pillar to allow for the existence of thresholds, or minimum values required before an increase in a pillar value affects resilience. A resilience score is generated for each household and then standardized so that values fall between 0 and 1, with higher scores indicating greater resilience.

The mathematical expression of the RIMA framework is as follows (FAO, 2016):

$$y = \lambda\eta + \varepsilon \quad (1)$$

$$\eta = \beta x + \zeta \quad (2)$$

where η is the latent variable representing resilience; y is an indicator or outcome of resilience; and (x_1, x_2, ..., x_n) are the determinants of resilience. In our analysis, as in typical RIMA-II analyses, food security indicators are used as y variables and the four resilience pillars enter as the x variables.

Following the computation of the resilience score, we perform regression analysis using tobit to estimate the effects of household characteristics and other factors on resilience, while controlling for payam (the administrative division under counties) specific effects. To account for the social and institutional environment, we construct variables to represent the quality of governance, strength of institutions, and exposure to conflict, using polychoric principal component analysis to estimate scores based on a larger number of underlying variables, as was done to calculate the pillars.

[6] Standard methods of performing factor analysis (i.e., those based on a matrix of Pearson's correlations) assume that the variables are continuous and follow a multivariate normal distribution. If the model includes variables that are dichotomous or ordinal a factor analysis can be performed using a polychoric correlation matrix. See Kolenikov and Angeles (2009) for a discussion of the advantages of using polychoric correlations when performing PCA on discrete variables.

[7] (Z-Zmin)/(Zmax-Zmin)